



Abstract-Topic D

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Paper No.	D101

Title:

Practical Engineering Approaches for Assessing Future Climate Conditions

Abstract:

As the evidence pointing towards climate change mounts, it is critical to consider future climate conditions in engineering designs and new developments meant to operate upwards of 50 years. It is the purpose of this presentation to present a few practical engineering approaches for the best estimate of plausible future climate conditions. Two different case studies will be reviewed; a mining operation in Arctic Canada and a proposed Carbon Neutral city in the Middle East. In both cases, a realistic assessment of baseline conditions was completed through a combination of available long-term historical data from climate stations in the region, and limited surface data from the study sites themselves. Three different approaches for predicting future climatic conditions were identified based on the specific engineering requirements of the projects. The approaches to be discussed include the application of Global Circulation Model results directly, statistical downscaling, and dynamic downscaling.



Abstract-Topic D

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Origin	Beijing, China	
Paper No.	D102	

Title:

Simulation of Aerosol Optical depth Over East Asia Based on The Model System RAMS-CMAQ

Abstract:

On the basis of the aerosol production simulated by Models-3 Community Multi-scale Air Quality (CMAQ) modeling system with meteorological fields simulated from the Regional Atmospheric Modeling System (RAMS) over East Asia during the year 2005, the aerosol optical depth (AOD) was calculated from two methods: "reconstruction mass-extinction (RM) method" and Mie theory method. In order to test the result reasonability, the simulated AOD was compared with two groundbased aerosol measurement nets: Aerosol Robotic Network (AERONET) and the Chinese Sun Hazemeter Network (CSHNET). It was found that the simulated AOD reproduces the temporal and spatial features reasonably well, especially over the natural environment. Correlation coefficients of linear regression for monthly mean scatterplot between simulated AOD and observed AOD could achieve or exceed 0.6 at most measurement sites, and some of them could reach 0.9. From the time series plot of daily mean of observed AOD and simulated AOD, the simulation could broadly capture the observed seasonal cycles. However, the dense human activities and complex topography at urban and such rural regions could influence the simulation and caUSAe AOD underestimate. The spatial plot of monthly mean AOD of RM method over East Asia indicates that over the whole East Asia the AOD was comparative lower during summer and higher during winter. Without considering sand dUSAt aerosol, the large value regions where AOD could exceed 0.8 km^{-1} were concentrated in Southwest China except Tibet and Yunnan Province, South China and Central China except Henan Province. In addition, in North China except Inner Mongolia, East China, Henan Province and north of Laos and Vietnam the values of AOD were comparative higher. However, in the most northern area, western area and southern sea area of East Asia the values of AOD were comparative lower during the whole year.



Abstract-Topic D

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Paper No.	D103

Title: Combating Climate Change in Kenya: Efforts, Challenges and Opportunities.

Abstract: Increase in emissions into the atmosphere of carbon dioxide and other Green HoUSAe Gases such as methane, nitroUSA oxide, CFC, and HCFC has led to the overall rise in global mean temperature over the years and the resultant climate change. CO₂ is the leading caUSAe of global warming contributing over 64 percent to the effect. Key anthropogenic activities responsible include fossil fuel combUSAtion and lanDUSAe change especially tropical deforestation. The earth's mean temperature has been rising steadily since the pre-indUSAtrial period with a notable rise of 0.55°C in the 1990s. 11 of the 12 hottest years on record occurred in the past 12 years. Impacts of climate change are controversial and are yet to be fully understood. That notwithstanding, there is significant circumstantial evidence within the scientific community that shows a caUSAal relationship between global warming, climate change and associated impacts. Impacts include: - rise in sea water level resulting to inundation of low-lying coastal areas and islands; warming of the oceans mean temperature with negative consequences on aquatic flora and fauna; coral bleaching; rapid retreat of polar glaciers; change in seasonal climatic patterns with notable changes in the frequency, intensity and distribution of rainfall and associated extreme events; increase of the desert margins of the world; spread of the vector-borne disease ranges, *inter alia*. For the developing countries such as **Kenya**, climate change is a threat to livelihood support systems. Kenya is currently experiencing the effect of climate change especially variation in weather patterns. Prolonged drought has currently left over 10 million people faced with starvation, while floods and resurgence of pests and diseases have been noted in other parts of the country. Widespread poverty, inadequate socio-economic resources and a large climate-dependent agricultural sector makes the country vulnerable to the vagaries of climate change and ill-equipped to adapt to the long-term changes in climate. In spite of these, Kenya has embarked on varioUSA measures to mitigate climate change such as adoption of clean development mechanism, re/afforestation and spread of green technology. This research focUSAed on Kenya's effort hitherto in combating climate change, the challenges thereon and opportunities for improvement.



Abstract-Topic D

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Paper No.

D104

Title:

The extinction contributions of aerosol particle size spectrum, compositions and secondary aerosols to visibility over the Pearl River Delta Region (PRD), China

Abstract:

The research on urban aerosol physical-chemical-optical properties and their radiative effects have become an important issue for the present study of regional environment and climate. The study analyzes the microphysical-chemical properties of aerosols in the background of rapid urbanization over the Pearl River Delta region (PRD), quantifies the extinction contributions of the spectra of both aerosol particle size and compositions to visibility. The result of the study will be scientifically guiding in making strategic suggestions for the visibility controls. The main achievements and some conclusions are as follows: The ultra-fine ($0.1\text{ }\mu\text{-m}$, with diameter less than $1\text{ }\mu\text{-m}$) and secondary aerosols have distinct features of pollution in the Pearl River Delta region. The mean diameter of the particles ($0.25\text{ }\mu\text{-m}$) is only $0.3\text{ }\mu\text{-m}$, taking up 99.4% of the total number density. The quota of PM₁ is high, with a ratio of PM₁/PM_{2.5} larger than 0.86. The secondary aerosol mass concentration takes up 50% of the total PM_{2.5} mass. Under the conditions of relative pollution, the secondary aerosol is much enriched, and the quota of secondary organic carbon is comparable with that of sulfate, making secondary organic carbon an important issue. The extinction contributions of aerosol particle size spectrum, compositions and secondary aerosols to visibility have been quantitatively evaluated. The analysis shows that the major cause for low visibility is high PM₁ aerosol concentrations. The extinction quota is about 80%-90% contributed by scattering and absorption from ultra-fine aerosol particles. The hygroscopic growth factors of extinction coefficients, calculated with aerosol compositions under wet environmental conditions with RH=60% and RH=90% are 2.1 and 3.4 respectively. The extinction quota of secondary aerosol is about 59% in dry environment, while reaching up to 75% and 84% in wet environment with RH=60% and RH=90% respectively. The aerosol hygroscopic growth can cause significant deterioration of the visibility. The key point for visibility controlling strategy is to further understand the forming mechanism and source appointment of ultra-fine particles (less than 1 μm in diameter) and secondary aerosols.



Abstract-Topic D

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Paper No.

D105

Title:

Impact of local and ambient air pollution sources on the air quality in Beijing

Abstract:

In this study, the relative importance of air pollution sources within and outside the city limits of Beijing, China to the air quality in Beijing is investigated by analyzing the spatial and temporal characteristics of the meteorological conditions associated with air pollution transport. Observations of SO₂, NO₂, PM₁₀ and PM_{2.5} from 2000 to 2004 were used for this investigation. Main conclusions are: 1) there is a seasonal variation in air pollutant concentration in Beijing. In spring, dust storms from the northwest have a large impact on air quality in Beijing. During dust storm events, there was a significant increase in PM₁₀ concentration, but a decrease in the concentration of SO₂ and NO₂. In summer, due to increased surface heating, the ozone concentration reaches its maximum annual value. In winter, the residents in Beijing and surrounding area use coal combustion for home heating. As a result, the peak value of PM_{2.5} occurs during the cold winter months of November-February; 2) the air quality of upwind urban areas significantly impacts the concentration of air pollutants in Beijing. Analysis using the Hysplit model and Satellite images showed that in spring the pollutants mainly come from the inner-Mongolia and Xinjiang autonomous region to the northwest. In summer, the main source of air pollutants is located to the south of Beijing, the major urban areas of Shijiazhuang and Tianjin. Maximum concentrations occur in the northern part of Beijing due to the cumulative effect of external and internal pollutants. Location of the Yan-Shan mountain to the north also adds to this effect; 3) Spatial interpolation analysis indicates that there is an aerosol transport pathway originating from the southern region outside Beijing.

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Abstract-Topic D

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Paper No.

D106

Title:

The source, long-range transport, and the characteristics of the highest-recorded floating dUSAt occurred at Shanghai in 2007

Abstract:

The highest-recorded floating dUSAt occurred at Shanghai with the daily PM₁₀ concentration of 648 μg m⁻³ was observed on April, 2007. The daily PM₁₀, SO₂ and NO₂ were monitored by automatic monitoring system in Shanghai and daily PM_{2.5} and TSP with their chemical composition were taken on the pathway of 7 sites of floating dUSAt in the spring of 2007 (20 March~19 April). The ratio of SO₂/PM₁₀, NO₂/PM₁₀ and PM_{2.5}/PM₁₀ were 4%, 10% and 19% on 2 April, which were significantly different from the non-dUSAt day and could be used as the index to judge the occurrence of floating dUSAt in Shanghai. The ratio of crUSAtal mater rose to 71% and 65% in PM_{2.5} and TSP on the peak day in Shanghai. The ratio of Ca/Al indicated the floating dUSAt was transported from Duolun (DL), Yulin (YL) near to the desert sources in Inner Mongolia instead of the other desert source of Tazhong (TZ) in Xinjiang province. The compositions of sea salt aerosol (SSA) in PM_{2.5} and TSP as well as the backward trajectories approved the floating dUSAt passed by the upper sky of ocean before reaching Shanghai which is unique from the normal pathway of floating dUSAt

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Abstract-Topic D

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Paper No	D107

Title:

Black carbon aerosols and their radiative properties in the Pearl River Delta region

Abstract:

The climatic and environmental effects of atmospheric aerosols are one of the existing hot topics in global science community. Radiative properties of the aerosols are one of the important parameters in assessing climatic change. Here we studied the black carbon concentration and absorption coefficient measured with aethalometers, scattering coefficient measured with nephelometers, and single scattering albedo derived, at an atmospheric composition watch station in Panyu, Guangzhou in the time 2004 – 2007. Our main results are as follows. The data of black carbon concentration and absorption coefficients measured with instruments cannot be directly used until they are measured in parallel with internationally accepted instruments for comparison, calibration, and reduction. After evaluation of the data, the result shows that the monthly mean of BC concentration varies between 3.1 $\mu\text{g}/\text{m}^3$ and 14.8 $\mu\text{g}/\text{m}^3$ and the concentration decreases by about 1 $\mu\text{g}/\text{m}^3$ in average over the four years; It is higher in the dry season with a multi-year mean of 9.1 $\mu\text{g}/\text{m}^3$ and lower in the rainy season with a multi-year mean of 7.7 $\mu\text{g}/\text{m}^3$; The extreme maximum of monthly mean concentration occurred in December 2004 and extreme minimum in July 2007, and a 4-year mean is 8.4 $\mu\text{g}/\text{m}^3$. It is also shown that monthly mean scattering coefficient derived varies between 129 Mm^{-1} and 565 Mm^{-1} , monthly mean absorption coefficient between 32 Mm^{-1} and 139 Mm^{-1} , and monthly mean single scattering albedo between 0.71 and 0.91, with annual mean values of 0.80, 0.82, 0.78 and 0.84 for 2004, 2005, 2006 and 2007, respectively. Three instruments were used to take simultaneous measurement of BC in PM₁₀, PM_{2.5}, and PM₁ and the results showed that PM_{2.5} took up about 90% of PM₁₀ and PM₁ accounted for about 68% of PM_{2.5}, and BC aerosols are mainly present in fine particulates. The variability of BC concentrations is quite consistent between the Panyu station (131 m above sea level) and the Nancun station (13 m above sea level), which are 8km apart from each other. The concentration in higher altitude station (Panyu) is consistently lower than the lower altitude station (Cancun) and the difference of annual mean is about 4 $\mu\text{g}/\text{m}^3$.



Abstract-Topic D

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Paper No.	D108

Title:

Measurements of Aerosol and Cloud Particles on Mt.Huang: Preliminary Results

Abstract:

A series of measurements were carried out on the top of HuangShan Mountain in China from April to July 2008/2009 in order to study aerosol-cloud interaction. The observation concerns aerosol size and concentration, aerosol radiative property, CCN concentration, cloud/fog microphysical properties and its connection with meteorological factors. Preliminary analysis shows that according to different air mass, the number concentration of aerosol particles is largely different. The value is low in foggy days, with a accumulation mode size distribution and the aerosol concentration is well correlated with the concentration of cloud/fog droplets. While the value is relatively higher in sunny and polluted days, exhibits two modes size distribution, consisting of a accumulation mode and a new nucleation mode. This indicates that ultrafine particles were brought by either polluted or oceanic air mass. Although ultrafine particles had higher concentration in polluted days, the analysis also indicates that the accumulation mode aerosol takes main contribution to activation of CCN. The CCN spectra at Mt.Huang shows it have continental characteristics in the sunny days and oceanic characteristics in the foggy days.



Abstract-Topic D

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Paper No.	D201

Title:

Mapping reservoir water quality with the spaceborne Formosat-2 multi-spectral imagery and the airborne Intelligent Spectral Imager System hyper-spectral imagery

Abstract:

The reservoir is the primary source of freshwater for most of the cities around the world. Therefore, an effective and reliable method for monitoring the water quality of a reservoir is crucial to meet the basic requirement of human beings. Progressing in remote sensing technology has enabled the observations of ocean color to be made from space, which can be used to retrieve the concentrations of chlorophyll-a (Chl-a), total suspended matter (TSM) and colored dissolved organic matter (CDOM). The limited spatial and spectral resolutions of the existing spaceborne ocean color sensors, however, are inappropriate for monitoring the reservoir water quality. Therefore, this research attempts to investigate the feasibility of mapping the reservoir water quality with the data collected from the other remote sensing platforms, such as the spaceborne Formosat-2 multi-spectral imagery and the airborne Intelligent Spectral Imager System (ISIS) hyper-spectral imagery. Several field campaigns synergic with Formosat-2 or ISIS image acquisitions were conducted in Tseng-Wen Reservoir (TWR). The remotely-sensed water qualities were retrieved by applying both the empirical and semi-analytical algorithms to process the Formosat-2 and ISIS images, respectively. The results were evaluated by comparing to the in-situ data. The results indicate that the time series of Chl-a derived by the empirical algorithm and multi-temporal Formosat-2 images fit well with the monthly Chl-a variability of TWR. By employing the semi-analytical ocean color algorithm to process the hyper-spectral images, the retrieval accuracy is much improved and the extra water quality parameters can be obtained. For example, both TSM and CDOM can be accurately derived from the ISIS images. This research demonstrates that the airborne ISIS hyper-spectral images have potential in integrating with the existing approaches to monitor the water quality of TWR. In addition, the multi-temporal images taken by Formosat-2 serve as a good supplementary to assist USA to gain a better understanding of the reservoir water quality trends.



Abstract-Topic D

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Paper No.	D202

Title: Predicting water and nutrient discharges impacted by urban development and climate change: a case study in Chesapeake Bay

Abstract: The interaction between urban development and climate change will affect future nutrient loading to coastal waters. Such changes are important because many estuaries are already degraded by excess nutrient inputs. We used a watershed model to explore how urban development and climate change might affect future nutrient inputs to Chesapeake Bay. We first used multi-objective optimization and multi-site averaging to calibrate and validate the General Watershed Loading Function (GWLf) model for five subwatersheds draining to the Rhode River, a tributary subestuary of the Chesapeake Bay. Values of 16 hydrological and nutrient parameters were estimated in the calibration process. The calibrated model was then applied to predict material discharges from Inner Coastal Plain watersheds on the western side of the Bay and from Central Coastal Plain watersheds on the eastern side of the Bay. The future climate scenario was based on projections from the Hadley climate model for the 2007-2099 period. The future land cover scenario was based on projections from the SLEUTH model as implemented by the Chesapeake Bay Program. We used the same land cover projection in both prediction periods of 2030 and 2095. In comparison to multi-objective optimization method at a single site, the multi-site weighted average approach reduced the relative mean absolute error by 3.9-7.6% for monthly stream flow, 1-6.5% for monthly total nitrogen (TN), and 1.1-7.5% for monthly total phosphorus (TP), respectively. The GWLf model predicted a slight decrease in average annual stream flow and slight increases in average annual TN and TP discharges in the year 2030 compared with a baseline of 2000. By 2095, all stream flow and nutrient discharges were predicted to increase. The relative annual increase rate for TN was greater than for TP; and the relative annual rates of increase for both TN and TP were greater than the relative annual rate of stream flow increase. By 2095, annual discharges of water, TN, and TP were predicted to increase by 18%, 36%, 33%, respectively, compared to the 2000 baseline. In our simulations, urban development will increase discharges of water and nutrient, but the influence of climate change is highly uncertain. Our results suggest that the influence from both climate change and urban development must be considered in management efforts to reducing nutrient loading to the Chesapeake Bay.



Abstract-Topic D

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Paper No.	D203

Title:

Climate and vegetation change as revealed by Holocene

Abstract:

Environmental Change, in this study referring to, climate and vegetation change, have in recent years taken a importance in the international debates as the effects become more severe and obvious. In this study phytoliths analysis was used to study Holocene climate and vegetation change via careful examination of the modern and past plant composition, bearing in mind that plants found in particular localities are dependent on top of other things on climate. Any alterations in climate would inevitably be reflected in the underlying vegetation and the phytoliths in the depositional sites. The main objective of this study was to reconstruct the micro-environments and assess the environmental change on the study sites, namely Pangani river basin, Tanzania and Yangtze river basin China. In order to accomplish that task top soils, river sediments and plant samples were collected from selected locations in the named sites. All laboratory works, namely extraction of the present and geological phytoliths (from plants & top soils and fossil soils respectively), for this study were done in the Key Biogeological and Environmental Laboratory of China University of Geosciences, Wuhan. Through careful study of the present and past phytoliths information, and with the help of radioactive dating, and extensive literature review, many poorly understood information about environmental change from the two study sites were uncovered. The results show that in both study sites, there has been substantial change in climatic parameters and consequently vegetation compositions. Currently the climatic and aridity indices are being calculated, the preliminary projections strongly suggest a warming up of the two micro-environments. The results from this study are crucial in understanding both local and regional climatic and vegetation trends. The totality of the present study will help in the planning of the natural resource management and better understanding of various interacting parameters affecting our planet Earth. The study will also add to the phytoliths database, especially in Tanzania which is generally none existent.



Abstract-Topic D

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Paper No.	D204

Title:

Source apportionment of POPs in the NY/NJ Harbor

Abstract:

Persistent organic pollutants (POPs) are among the most prominent concerns in the New York-New Jersey Harbor due to both legacy contamination and on-going inputs from various sources. Identification of the major contaminant sources and apportionment of source contributions are very important for better understanding contaminant distributions and sources in this area. The Contaminant Assessment and Reduction Project (CARP) measured a variety of POPs, including polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs), polychlorinated dibenzo-p-dioxins/furans (PCDD/Fs), and organochlorine pesticides (CPs) in the water and sediment of the New York/New Jersey Harbor. In this study, data of the four classes of POPs, PCDD/Fs, PAHs, CPs and PCBs, in the ambient waters of the Harbor were extracted from the CARP database and were analyzed via Positive Matrix Factorization (PMF) to identify primary pollutant sources. 19 PAH chemicals in 109 water samples, 90 PCB chemicals in 141 water samples, 16 PCDD/F chemicals in 90 water samples, and 27 CP chemicals in 129 water samples were statistically analyzed and model predicted by PMF. The results indicated that there exist 5 major sources for PAHs, 7 major sources for PCBs, 5 major sources for PCDD/Fs and 6 major sources for CPs in the area of NY/NJ Harbor. Model analyses of PCBs and PCDD/Fs combined and all POPs pooled together data sets revealed that many of the sources of organic contaminants to the Harbor are combined sources, contributing not only PCBs, but PAHs, pesticides, and PCDD/Fs as well.



Abstract-Topic D

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Paper No.	D205

Title:

Water quality protection of the upper Han River for the Middle Route of the South-North Water Transfer Project, China

Abstract:

The upper Han River basin with a drainage area of approximately 95,000 km², is the water source area of the Middle Route of China's South to North Water Transfer Project. ThUSA, water quality conservation in the basin's river network is of great importance. A watershed water quality management program has been implemented in the Han River basin, and the objectives are to quantify basin's ecosystem function and to develop an integrated water quality conservation system. This study at first summarizes the major eco-environmental problems such as water pollution, unreasonable land USAe/land cover construction and soil erosion, then land USAe/land cover, water-soil erosion distribution, characterization of riparian ecosystem and spatial and temporal variations of water quality variables (physico-chemicals, metals, nutrients and major elements) especial nutrients (nitrogen and phosphor) with respect to water quality conservation are represented. Finally, major pollutants and their origins, major polluted catchments and their formations are examined for measures taken for water quality conservation in the basin, and further scientific questions including biodiversity and ecosystem function have been put forward.



Abstract-Topic D

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Paper No.	D206

Title: Study of Eutrophication Level and Annual Variation in Zhejiang Coastal Areas

Abstract: Coastal eutrophication is a recently recognized phenomenon, and scientific investigations of this human disturbance have progressed.

Survey results about Zhejiang coastal area in 2008 showed that, there were clear signs of eutrophication, especially in Yangtze Estuary, Hangzhou Bay, Xiangshan Harbor, Sanmen Bay and Leqing Bay. The Eutrophication Indexes (EI) was 5.13, 15.15, 3.54, 1.30 and 1.56 respectively. The high-value areas are mainly located at the west of 122.5 ° E where the runoff impact is comparatively significant. Seasonal variation of EI can be found easily by the investigation results, that is the eutrophication level in spring and autumn is greater than that of summer.

According to the analysis of investigation data, the eutrophication state of Zhejiang coastal area is tending serious year by year. The average EI rose from 2.38 in 1992 up to 17.3 in 2000. However, the situation improved since 2002. In 2008, the eutrophication level has been recovered to the level in 1996. The Si/N ratio in autumn kept stable before 2002, however, the values began to decrease rapidly from 2003. In 2007, it declined to 0.9. The variation trend of Si/N ratio has significantly positive correlation with the incoming sediment amount of Yangtze River during the same period. Different from the Si/N ratio, the N/P ratio in summer and autumn kept increasing since 2002. It reached 123.3 in 2007 while the value in the summer of 2002 is 52.3. It is the same trend in autumn.

The primary production in Southeast Zhoushan Area and Northeast Yangtze Estuary has the evident sign of phosphorus limitation. The phytoplankton community structures in the study areas have been changed to microphytoplankton and nanophytoplankton because of the disturbance of Si/N ratio and N/P ratio. The dinoflagellate species increased from 12.3% to 18.8%, at the same time, the amount of diatom species decreased. Finally, we have found that the occurrence of red tide has shown an upward trend recently, among which, the red tide caused by dinoflagellate account for 66 percent during 2000 to 2004.



Abstract-Topic D

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Paper No.	D207

Title:

Effect of acid mine drainage on leaf breakdown in a subtropical stream of southern China

Abstract:

The objectives of our study were to compare leaf-litter breakdown in two tributary streams of Hengshishui River in northern Guangdong, China, one of the streams is polluted by acid mine drainage (AMD) with low pH (2.5), the other is a nearby non-polluted neutral stream. Leaf decomposition experiments were carried out for 107 days with two native tree-leaves of *Bauhinia variegata* (Caesalpiniaceae) and *Castanopsis hystrix* (Fagaceae), using coarse and fine mesh litter bags. The results shown that the decomposition rate in the neutral stream proceeding significantly faster for both leaf species than in the acidic stream. In the neutral stream, k values (D_1) over 107 days were 0.21 for fine-mesh type and 0.29 for coarse-mesh type in the leaf bags of *B. variegata*; 0.14 for fine-mesh and 0.16 for coarse-mesh in the leaf bags of *C. hystrix*. But in the acidic stream k values (D_1) were 0.09 (coarse-mesh) and 0.08 (fine-mesh) for *B. variegata*; 0.06 (coarse-mesh) and 0.05 (fine-mesh) for *C. hystrix*. The faster decomposition rates of leaf litters in the non-acidic stream revealed that macroinvertebrates play an important role in the breakdown process. The slower rates of leaf litter decomposition in stream impacted by AMD indicated that microbial activity is depressed under acidic conditions. Our findings suggest that the breakdown of leaf litter in stream polluted by AMD can be inhibited by low pH and probably also the precipitation of heavy metals.



Abstract-Topic D

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Paper No.	D301

Title:

Second Generation Polar-Orbiting Meteorological Satellites of China: Fengyun 3 and its application on global environmental monitoring

Abstract:

Fengyun 3 series are the second generation polar-orbiting meteorological satellites of China, which expect to perform global, 3-dimensional, quantitative and multi-spectral observations under all weather conditions (i.e., cloudfree and cloudy conditions) with multiple sensors onboard. First satellite of Fengyun 3 series (FY-3A) is a research and development satellite. FY-3A has been launched successfully at 11 am of May 27, 2008. In this paper, the platform and the payloads are specified. Improvements of FY-3A on the Earth observations are summarized by comparing with Fengyun 1 series. The ground segment and retrieval products generated from this system are introduced. Since the launch, the FY-3A data have been applied to the services on the flood season and Beijing 2008 Olympic Games. The typical services and the images during the on-orbit commission test are selected to render. Its applications on global environmental monitoring are extremely stressed.



Abstract-Topic D

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Paper No.	D302

Title:

MIPAS-ENVISAT and IASI-METOP ozone data fUSAion

Abstract:

Complementary information on the vertical distribution of atmospheric ozone can be obtained by exploiting the passive measurements acquired by the high resolution infrared spectrometer MIPAS (Michelson Inteferometer for Passive Atmospheric Sounding) operating in the limb-sounding mode on-board the ENVISAT platform and by the nadir-looking instrument IASI (Infrared Atmospheric Sounding Interferometer) on-board the European meteorological satellite METOP-A. MIPAS observations cover the altitude range from the lower mesosphere to the upper troposphere, allowing ozone retrieval down to 6 km with a resolution of about 3 km in the stratosphere, whilst IASI vertical sounding can be USAed to determine ozone partial columns with up to 4 degrees of freedom from the top of the atmosphere down to the surface. We have investigated the possibility of combining the vertically resolved information on upper tropospheric and stratospheric ozone contained in MIPAS measurements with the ozone signal from the lowermost layers associated to IASI spectral radiances, by applying the Measurement Space Solution method (MSS). The MSS method is a technique developed for optimal representation and utilization of the information retrieved from atmospheric measurements and it is particularly well-suited for data fUSAion applications. In this work, we will apply the technique to the fUSAion of MIPAS and IASI ozone data and demonstrate the resulting improvement in the quality of the ozone products USAing both simulated retrieval experiments and application to real data.



Abstract-Topic D

Author

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Paper No.

D303

Title:

Atmospheric trace gases measurements with groundbased and airborne DOAS in China

Abstract:

Passive DOAS techniques have become an important tool in atmospheric research. Groundbased, aircraft borne MAX-DOAS instruments use scattered sunlight to measure tropospheric trace gas concentrations and profiles. The observations from groundbased, aircraft borne MAX-DOAS are very useful for analysis of regional air pollution and transportation as well as validation of satellite data (e.g. NO₂ observation). For this purpose, we have deployed MAX-DOAS instruments in Beijing (June 2008), Hefei (May 2008), Shanghai (May 2009), Guangzhou (July 2009) to perform an automated network monitoring of vertical columns of NO₂/SO₂ over China. A standardized MAX-DOAS instrument was developed for the network. During the time period of Beijing Olympic Games, 10 MAX-DOAS instruments were installed in Beijing to capture the regional pollution pattern. During Dec. 2008, an aircraft measurement was performed in Pearl River Delta region for the observation of NO₂, SO₂ and CO with airborne DOAS and FTIR. In this presentation, the MAX-DOAS network are introduced, and the preliminary results from both ground and aircraft measurements are discussed and compared with OMI data.



Abstract-Topic D

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Origin	Sichuan, China
Paper No.	D304

Title:

A new approach for atmospheric correction and land surface temperature retrieval

Abstract:

The accuracy of Land surface temperature (LST) retrieval from satellite is mainly limited by three factors: 1) the IR radiative transfer is affected by atmosphere (mainly water vapor and cirrus clouds); 2) the complex coupling between LST and land surface emissivity (LSE) makes the LST retrieval to be a difficult problem due to under-determination; 3) sensor performances. The atmospheric perturbation, high variation of water vapor and LSE, the diversities of land surface configuration, altitude, and its material, and their synthetical effects make the problem even more complex and difficult to solve. Thus, how to couple land surface and atmosphere is very critical for retrievals of LST and atmospheric properties. While the statistical retrieval methods based on the differential absorption can not solve this problem well, only the physical retrieval method based on solving the radiative transfer equation have the possibility to couple the action between land surface and atmosphere and to retrieve LST and LSE. Therefore, the physical retrieval method has become an essential aspect in the atmospheric correction.

The water vapor scaling (WVS) algorithm is a new atmospheric correction method with comparatively high accuracy developed by NASA for ASTER (Advanced Spaceborne Thermal Emission and Reflection Radiometer), in which at least 4 to 5 IR channels within 10-12 μm must be used. Based on this algorithm we develop a new atmospheric correction method for the FY-3 radiometer, FY-3 -WVS, using only two thermal IR (TIR) window channels. Some tests, including using MODIS data, numerical simulation for FY-3 sensor, the synchronous measurements for the radiative calibration of the FY-1D and FY-3 radiometers in Qinghai Lake respectively, for the FY-3 -WVS algorithm have been carried out. The results show that although the performance of FY-3 radiometer less well than other similar existing sensors, the root mean square error (RMSE) in temperature is less than 1.0K. For implementation,



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the fast calculation algorithm has been also developed and the RMSE is also less than 1.0K. In this paper some main points, especially our developments in the FY-3 -WVS algorithm are discUSAsed.

Author

Guang Guo, Chris Barnet



Abstract-Topic D

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Paper No.	D305

Title:

NPOESS Preparatory Project Validation Program for the Cross-track Infrared Sounder

Abstract:

The National Polar-orbiting Operational Environmental Satellite Suite (NPOESS) Program, in partnership with National Aeronautical Space Administration (NASA), will launch the NPOESS Preparatory Project (NPP), a risk reduction and data continuity mission, prior to the first operational NPOESS launch. The NPOESS Program, in partnership with Northrop Grumman Space Technology (NGST), will execute the NPP

Calibration and Validation (Cal/Val) program to ensure the data products comply with the requirements of the sponsoring agencies. The Cross-track Infrared Sounder (CrIS) and the Advanced Technology Microwave Sounder (ATMS) are two of the instruments that make up the suite of sensors on NPP. Together, CrIS and ATMS will produce three

Environmental Data Records (EDRs) including the Atmospheric Vertical Temperature Profile (AVTP), Atmospheric Vertical Moisture Profile (AVMP), and the Atmospheric Vertical Pressure Profile (AVPP). The AVTP and the AVMP are both NPOESS Key Performance Parameters (KPPs). The validation plans establish science and USAer community leadership and participation, and demonstrated, cost-effective Cal/Val approaches. This presentation will provide an overview of the collaborative data, techniques, and schedule for the validation of the NPP CrIS and ATMS environmental data products.



Abstract-Topic D

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Origin Beijing, China

Paper No. D306

Title:

The Satellite-based Estimation of Regional Particulate Matter Abstract

Abstract:

Based upon the theory of atmospheric radiative transfer, a positive correlation between the aerosol optical thickness (AOT) and the groundlevel particulate matter (PM) concentrations is developed. The vertical correction and the relative-humidity correction of AOT can effectively improve this correlation, according to which the groundlevel PM concentration could be estimated from AOT. The correlative analysis of the measurements obtained at ground shows that, 1) the correlation between AOT and the aerosol extinction coefficient (Ext) at surface grows higher (R^2 rising from 0.54 to 0.60) as a result of the vertical correction; 2) the correlation between Ext and PM concentrations is also significantly improved by the humidity correction (R^2 growing from 0.43 to 0.77). The correlation improvements support the conclusion from the theoretical analysis, and verify the methods of the vertical correction and the humidity correction of AOT in this paper. Based on the regression analysis of the measurements from one observing station in the central urban area of Beijing, two linear correlative models between AOT and the groundlevel PM concentrations (including PM₁₀ and PM_{2.5}) are established, of which the correlative R^2 are 0.62 and 0.67 respectively. According to the models, AOT derived from satellite remote sensed data are used to estimate the regional distribution of PM₁₀ and PM_{2.5} in Beijing area. The satellite-estimated PM is validated against the in-situ groundlevel measurements, and a good correlation ($R^2 = 0.47$) is found between them. Particularly in longer terms and over larger regions, the estimations and the measurements are more consistent. Profiting from the vast spatial coverage and the high observing frequency, the satellite remote sensing has great potential to monitor regional air pollution.



Abstract-Topic D

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Paper Number:

D307

Title:

Solar Backscatter Ultraviolet Sounder (SBUSA) on FY-3 Satellite and the Primary Results of Ozone profiles Deduced from its Measurements*

Abstract:

The FY-3 satellite is a second generation Chinese polar-orbit meteorological satellite. It was launched in May 2008. The Solar Backscatter Ultraviolet Sounder (SBUSA), one of the main payloads on the FY-3 satellite, is the first Chinese ozone-monitoring instrument on a meteorological satellite. The basic design and observing wavelengths of SBUSA are similar with SBUV/2 (Solar Backscatter Ultraviolet) on the American NOAA polar orbit series satellites. SBUSA carried out in-orbit observing for about 6 months, but came to stop work on December 27 2008 because of technique failure. As part of the in-orbit validation of FY-3, we carried out a retrieval trial using measurements from SBUSA during the period of 17-30 July, 2008, and compared those data with measurements and retrieved profiles from the National Oceanic and Atmospheric Administration (NOAA) satellite SBUV/2. The results show that the precision of the measurements and retrieved profiles are quite good. The averaged relative difference percentages of the ozone profiles retrieved from SBUSA and those from SBUV/2 are within $\pm 7\%$. The primary retrieved ozone profiles show quite good consistent with those from SBUV/2.

Supported jointly by National Natural Science Foundation of China (Grant No. 40775024), National Basic Research Program of China (Grant No. 2005CB422202) and the 2nd ESA-MOST "Drag-Star" Program (GrantNo.5253).



Abstract-Topic D

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Paper No.	D308

Title:

Satellite Observation of Trace Gases in the Middle to Upper Troposphere USAing Infrared Sounders

Abstract:

The profiles of multiple trace gases, such as CO₂, CH₄, CO, O₃, N₂O and HNO₃, have been retrieved at NOAA / NESDIS / STAR USAing the Atmospheric Infrared Sounder (AIRS) on the EOS/Aqua and the Infrared Atmospheric Sounding Interferometer (IASI) on METEOP platform. The most sensitive pressure levels are at middle to upper troposphere. By USAing the retrieved concentration of these trace gases in the middle to upper troposphere in conjunction with model simulations, we will be able to quantify the surface emission as well as the transport of these gases over regional and hemispheric scale. ThUSA, space-borne observation of these trace gases would provide an efficient way to monitor the atmospheric environment. While much more satellite sensors are available or will be deployed on space, validations USAing balloon-borne and aircraft measurement, and/or ground based remote sensing are not enough to assess the quality of satellite products. One difficulty in the validation and interpretation of the space-borne observation USAing infrared sounder is the changing of information content as well as the sensitive pressure levels with the changing of real atmospheric states, therefore the averaging kernels of the retrievals have to be taken into accounts in the validation and appropriate interpretation of the spatial and temporal variation of these gases retrieved. Here we will present the retrieval method, some validation experiments and application of trace gases products.



Abstract-Topic D

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Paper No.	D309

Title:

Straw Burning Distribution and its impact on Air Pollution Based on Modis Remote Sensing Monitoring.

Abstract:

Every autumn is the main harvest time for wheat in China, so autumn becomes the serious period for straw burning which results to serious air pollution. For straw burning distributing in counties, villages, is not easy to be verified and counted, straw burning treatment doesn't work very well. Satellite remote sensing technology with its characters of high time effectiveness, convenient data acquirement and cheapness, can be used to accurately monitor straw burning distribution in large area. There are a lot of research and applications in this regard, especially focusing on acquiring straw burning location, the number and distribution of fire points. However, this kind of research lacks of the relationship between the straw burning and the air quality. This paper got the straw burning result from the fire anomaly points products based on MODIS Remote Sensing monitoring in China in June 2007, analyzed the result of distribution status of the whole country, and especially took Beijing as an example, analyzed the effect of straw burning on its air quality. During the straw burning fire points selection process, firstly the spatial cut function of ArcMap, a kind of GIS software, was used to extract heat anomaly points in China from global fire anomaly data. Then in order to get straw burning fire points, land use and land cover material and the Chinese Wheat Division Map layers were used to select by GIS tools. Finally in order to eliminate other left fixed fire sources, through studying the character of all fire points in one year, those fire points at the same location appeared within three seasons were excluded. In the process of acquiring non straw burning fire points, the location of some iron works and thermal power stations were also excluded by searching on internet or acquired from cumulative data. To the cluster points within 1 KM, considering locating errors, the central point was selected as a fire point and its surrounding points were deleted. During the process of analyzing the effect of straw burning on air quality, firstly by the method of buffer analysis and mathematical method, MODIS straw burning fire points within 600km, 700km, 800km around Beijing and its nearby areas in June,



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2007 were compared with the ground monitoring API and its grade data. Then combined with meteorological data, further analyzed the comprehensive effect of both of them to the air quality.

The result showed that the straw burning fire points were mainly distributed in the winter wheat product area, and the North China Plain was the concentrating area which consists of the 86.9% fire points of the whole country. In June, the first half of the month was the main time for straw burning, during which the fire points consisted of the 87.3% of the whole month. The statistic analysis showed that the change trends between the fire points in the buffer area of 700km and 800km in Beijing and the air pollution index were relatively good, the relation coefficient were 0.54. The results also showed that straw burning would result in serioUSA air pollution when it happened in the bad atmospheric condition unfavorable to pollution dispersion.



Abstract-Topic D

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Paper No.	D310

Title:

Satellite Observations of Troposphere SO₂ Over China During 2005-2007

Abstract:

This paper presents for the first time results of measurements of tropospheric sulphur dioxide (SO₂) from satellite over China during 2005-2007. SCIAMACHY/ENVISAT SO₂ data products have been validated by comparison with data from another satellite instruments, OMI/ARUA, with in-situ observations at three regional GAW background stations in China, and with predictions of the atmospheric model GEOS-Chem. The spatial and temporal distribution of tropospheric SO₂ over China is discussed in this study. The results show that the east of China and the Sichuan basin are heavily polluted areas in China. Typical seasonal variation with high pollution levels in winter and low in summer in the northwest of China is found, while the inverse seasonal variation is found for the south of China. The characteristics of tropospheric SO₂ over megacities in China were explored and the results show that tropospheric SO₂ over most of these cities decreased or showed no increase during 2005 to 2007, after the policy of the Chinese government to reduce SO₂ emissions. Guangzhou city shows high SO₂ pollution levels in summer time, since most of the coal power plants and thermal power industry are located to the south of Guangzhou city and southerly winds dominate during summer time. A positive correlation between surface SO₂ concentrations and tropospheric SO₂ columns has been found for Beijing and Shanghai, which demonstrates that the SO₂ emissions from the ground contribute much to tropospheric SO₂ over megacities.



Abstract-Topic D

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Paper No.	D311

Title:

Aerosol monitoring from HJ-1 CCD camera

Abstract:

Aerosol is a key parameter in environment protection, and there is a close relationship between aerosol and Particle Matter 10. From space-borne data, the aerosol can be monitored largely and quickly. On September, 2008, HJ-1 A/B was launched successfully. On HJ-1 platform, there are three sensors: CCD, hyper-spectral and infrared camera. There are four bands in CCD camera: blue, green, red and near infrared. For the quantitative application of HJ-1 data in air monitoring, it is important to acquire the aerosol. For CCD camera, the spatial resolution was 30 meter at nadir and the swath was 720 km. In this paper, from HJ-1 CCD camera, the Aerosol Optical Depth (AOD) was retrieved and validated in Jing-Jin-Tang area. The method of HJ-1 CCD camera was based on DDV method. The AOD was retrieved from red and blue bands. Because of no band in Short Wave Infrared (SWIR), the dark pixel was recognized by Normalized Difference Vegetation Index (NDVI). And, the ratio of Red/Blue surface reflectance was also acquired. From the ratio, the land reflectance and AOD were acquired at the same time. The AOD was received as follow: 1) The LUT of atmospheric parameters was worked out by inputting viewing geometry, aerosol, land surface, and sensor parameter to the Second Simulation of the Satellite Signal in the Solar Spectrum (6S) model; 2) after data resample and radiative calibration, the Top Of Atmosphere (TOA) reflectance was received; 3) interpolated the LUT and retrieved the AOD; 4) the AOD images were being smoothed by 9*9 filter; 5) thematic maps of aerosol were printed by ArcMAP. From September 20 to November 4, CCD images of HJ-1 in Jing-Jin-Tang area were achieved in 12 days. Then the AOD images were retrieved by the method which was described above. And the results were validated by ground measurement AOD of Xianghe station which is one station of Aerosol Robotic NETwork (AERONET). The results shows: 1) From HJ-1 CCD data, spatial distribution of AOD can be retrieved for the lower reflectance of dark pixels at red and blue bands; 2) The accuracy was high by ground-based data. But for advanced applications, more works were needed.



Abstract-Topic D

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Paper No.

D312

Title:

Vegetation Cover Change and Their Relationship with Rainfall and Policy in Different Physiognomy Areas of Loess Plateau

Abstract:

Vegetation plays a very important role in controlling the soil and water loss. Loess Plateau is one of the greatest serious places for soil and water loss so that the government made a series of policies including conversion from farmland to forest. The project of returning farmland to forests is the key measure to restore the ecological vegetation and protect the ecological environment from deterioration. How the result of these policies and what the limited factor for revegetation needed to be studied urgently. Remote sensing holds advantages for its multiple bands and multi-phases in observing the globe surface.

Based on the NOAA/AVHRR 10-day maximum value composite NDVI data with 1 km resolution in July from 1988-2005, the spatial and temporal distribution of NDVI in different physiognomy areas of Loess Plateau was analyzed and the vegetation change between the pre- and post-phases of the conversion from farmland to forest was compared. Then, according to the distribution and change mentioned before, the correlation between NDVI and rainfall in the same term was established and the impact on NDVI from farmland to forest policy was analyzed in this paper. The results showed that the average NDVI was 0.29 in the whole of Loess Plateau, more than 0.4 in island mountains, between 0.3-0.4 in Huangtu Yuan, and less than average in other areas; The vegetation change between the pre- and post-phases of the conversion from farmland to forest was different and showed a zonal distribution from north-east to south-west in different physiognomy areas, and had a



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gentle increase in whole Loess Plateau, a higher increase in the principle part of Loess Plateau, especially in the serioUSA soil and water loss areas. This means that the policy of the Conversion from Farmland to Forest had exerted the government macrocosmic adjUSAtment function greatly; Moreover, they were positive correlation ($R^2 > 0.6$) between the maximum NDVI in July and the cumulate rainfall from May to July in some physiognomy type areas except the rocky mountainoUSA area, low loess hill area and plain area. Since 1998, there were successive 6 million, 3.48 million and 2.69 million invest as soil and water conservation funds in Wuqi County, Yanchang County and Fu County located in Beam hilly areas, Huangtu Broken Yuan, Huangtu Yuan separately. In the regions, the average NDVI was respective 0.194, 0.192, 0.338 before 1998, and after 1998, it increased to 0.271, 0.219, 0.374. Taking 1998 as a dividing line, it increased by 40%, 14% and 10% separately. The results showed the policy of returning farmland to forest, especially the forest and grass constructions had played a positive role.



Abstract-Topic D

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Origin	Wuhan China
Paper No.	D313

Title:

The Analysis of Monthly NDVI Evolution Process and the Separation of Spatial-temporal in the Yangtze River Valley.

Abstract:

Land USAe-cover change (LUCC) is a hot topic in the global change research, and vegetation is an important type of land cover and is an important index for regional eco-environment. USAing quantitative remote sensing, this research examines the spatial and temporal features of the variation process of vegetation in the Yangtze River Valley based on Normalized Difference Vegetation Index (GIMMS/NDVI) data set, which was collected at a spatial resolution of 8 km and 15 days interval, for the period from 1982 to 2006. Empirical Orthogonal Function (EOF), Rotated Empirical Orthogonal Function (REOF), and Expand Empirical Orthogonal Function (EEOF) were USAed to analyze the spatial and temporal features of the oscillation characters, the spatial distribution of the correlation structure and the propagation of monthly NDVI. The result shows that: (1)There are three types of NDVI oscillation structures in the region which are all-consistency, west-east anti-phase and north-south anti-phase types, and the all-consistency type is the dominant oscillation structure. (2)The Yangtze River Valley can be divided into four subregions USAing REOF and each subregion has the same NDVI variation features (increase or decrease at the same time on the time scale of one month). (3) The propagation of NDVI increase (or decrease) from high latitudes to low latitudes is the most significant spatial-temporal change character. NDVI positive (or negative) anomaly firstly takes place in the high latitude region in the middle reaches of the river valley, and the increase (or decrease) trend propagates to the upper and lower reaches of the river valley. (4) The NDVI variation characters of all-consistency and the propagation of NDVI increase (or decrease) along the latitude have a 1-year cycle and these characters gradually weaken over the years. The NDVI variation characters of west-east anti-phase structure, north-south anti-phase structure and the propagation of NDVI increase (or decrease) along the longitude have a half-year cycle and these characters gradually strengthen. These characters of NDVI variation indicate that the influence of climate change on vegetation and LUCC gradually weaken in the Yangtze River Valley.



Abstract-Topic D

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Paper No.	D314

Title:

Spatial and Temporal Variation in the Snow Covers in The Tibetan Plateau

Abstract:

This paper is an investigation of snow cover distribution, spatial and temporal variation of the Tibetan Plateau (TP) during autumn of 2003 to summer of 2006. MODIS eight-day snow cover productions (MOD10A2) of the U.S. National Snow and Ice Data Centre (NSIDC) are used and GIS is the main processing software. The results show that: 87% of the TP area experiences snow cover at some date throughout the year. The spatial distribution of snow cover over the TP is extremely variable. Heavy snow cover is situated mainly in the high mountainous regions; these contribute to about 14% of the TP. The vast interior of the Plateau (73%) receives light snow cover. The permanent snow covers an area of 48624km², around 2% of the TP, and the north western permanent snow is greater than other parts.

In general, snow accumulation begins rapidly from September, reaching maximum snow cover between January and April. September and October are significant in snow cover accumulation. Snow accumulation in western and northern higher mountain regions occur mainly in September and southern and eastern mountain regions in October. In November snow cover decreases due to the minimum precipitation and milder average daily temperatures. The snow ablates gradually from May reaching a minimum during July and August. Snow ablation begins in the lower regions before the higher. The snow ablation processes begin earlier in the eastern part than in the western. The maximum snow ablation is in June for all three years.

During the three year study period, 94% of the days have snow cover less than 11%. Only two days had snow cover exceeding 20%. Annual snow cover in the second year was slightly larger than in the other two years.



Abstract-Topic D

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Paper No.

D315

Title:

Traffic restrictions associated with olympic games in beijing:reductions of no₂ from satellite measurements

Abstract:

Nitrogen oxide radicals (NO_x =NO+NO₂) originating from combustion, lightning, and soils largely control tropospheric ozone production. Nitrogen dioxide (NO₂) plays a central role in tropospheric atmosphere. The variability of NO_x concentrations in the lower troposphere is very large. The few available ground monitoring point observations of NO_x are difficult to produce regional scale concentrations. So for a long time, the global distribution of nitrogen oxides could only be analyzed by model calculations, because ground-based or air-borne measurement campaigns were necessarily temporally and spatially limited. An important step in filling the gap in our knowledge of NO_x global distribution has been made by the Global Ozone Monitoring Experiment (GOME) instrument on the Second European Remote Sensing Satellite (ERS-2). GOME launched in April 1995 allows the retrieval of Vertical Column Densities (VCDs) of NO₂ on a global scale. After the OMI (Ozone Monitoring Instrument) instrument was launched in 2004, it can provide the full global coverage of tropospheric NO₂ once a day. During the 2008 Summer Olympic Games in Beijing, NO₂ monitoring from satellite measurements and in situ ground-based measurements is a main air quality monitoring task. The Linear correlation between traffic and NO₂ concentration is found during a campaign in the 4th Ring road of Beijing. Therefore, changes in emissions of NO₂ during the traffic control can be studied according to OMI NO₂ level-2 data. In this paper, as a result of traffic restrictions, a reduction in NO₂ concentration derived using the Differential Optical Absorption Spectroscopy (DOAS), from satellite measurements is presented.



Abstract-Topic D

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Paper No.

D316

Title:

Haze monitoring model for Beijing Olympic games

Abstract:

On the eve of the Olympic Games, because of low visibility on haze day, people have such a vague and uncomfortable feeling that air quality of Beijing had been extensively concerned by home and abroad. Haze is defined as daily average visibility less than 10 km, relative humidity less than 80% and excluded other special events leading to low visibility. Remote sensing as a convincing method of monitoring atmosphere has been largely put into practices, but so far there is no report about haze distribution or haze optical thickness monitoring. The main reason is that it is difficult to wipe off the surface reflectance on haze day so that NASA MODIS Dense Dark Vegetation algorithm can not be applied on haze day.

Based on aerosol hygroscopic properties experiment and surface reflectance analysis in North China Plain, we increased the volume fraction of water-soluble particulate on haze day and assumed surface reflectance changed little that could be retrieved by semi-empirical BRDF models. From Mar. 1 to Sep. 30 2008, Haze model had been running to acquire haze distribution and intensity in Beijing and surrounding areas for Olympic atmosphere monitoring project. The effectiveness of haze optical depth retrieval algorithm was verified though contrast with ground equipment CE318 observations. The real-time monitoring in haze distribution and intensify for Beijing Olympic Games helped Beijing municipal government to carry out more measures to improve air quality conditions.



Abstract-Topic D

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Paper No.	D317

Title:

Retrieval and validation of global total column ozone from FY-3A/TOU

Abstract:

The first year data of FY-3A Total Ozone Unit(FY-3A/TOU) were collected to evaluate the the performances and retrieval methods. The in-orbit calibration coefficients were calculated by intercalibration process. Retrieval tests of total column ozone based on in-orbit calibration coefficients show that the TOU total column ozone has a rms relative bias less than 3% compared to AURA/OMI global total column ozone product and less than 5% compared to ground measurements. The solar irradiance is measured continuously and the in-orbit calibration coefficients will be updated only if the change of instrument's sensitivity change has noticeable influence on the retrieval, the instrument is stable currently.