



Qualità dell'aria alla base del Monte Everest (Himalaya, Nepal)

La Stazione ABC-Pyramid



Meteorologia e qualità dell'aria: dalla previsione alla prevenzione

Oggebbio 10 Giugno 2006

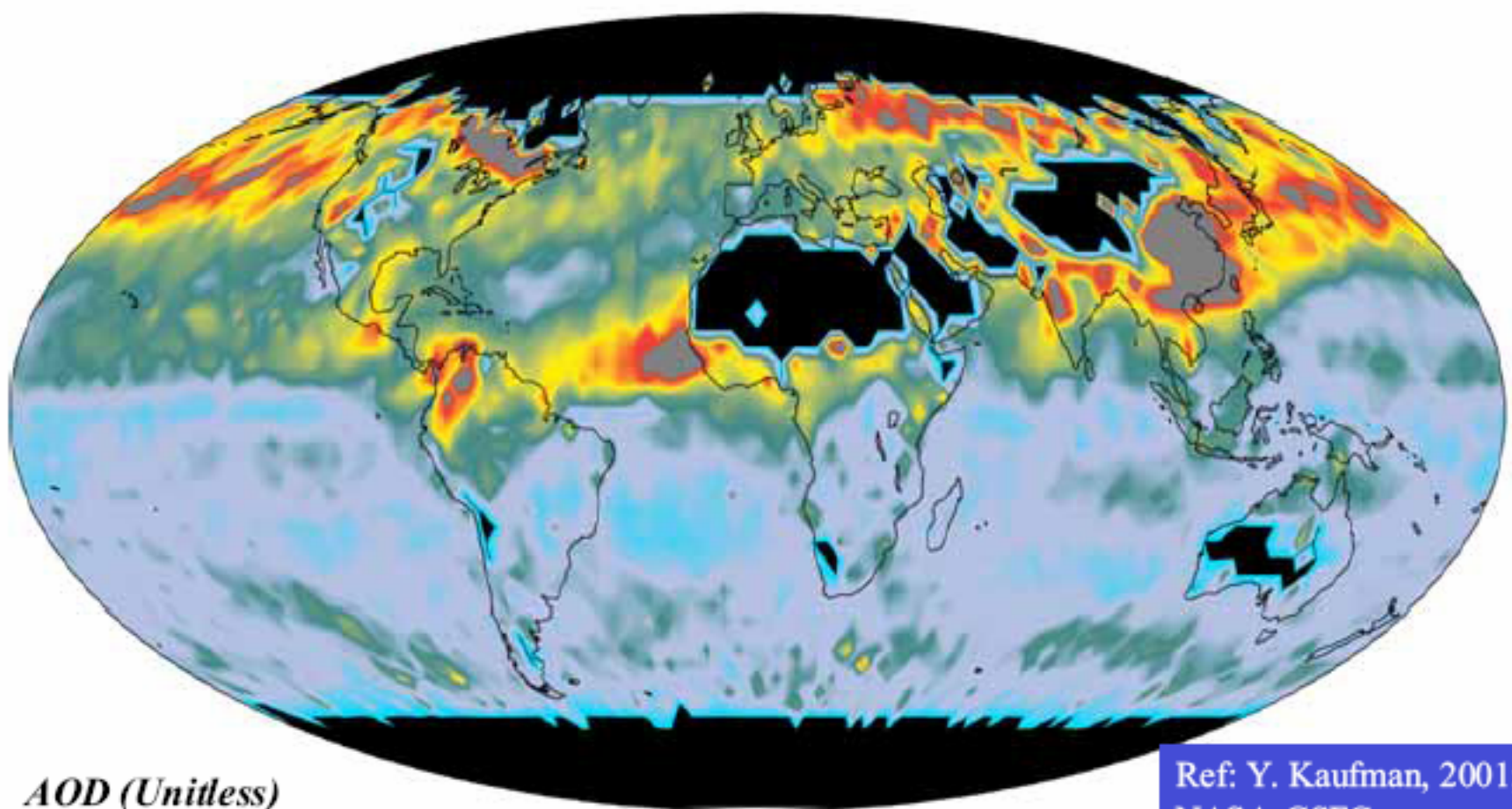
Gianni Tartari

Comitato Ev-K²-CNR, Bergamo & Istituto di Ricerca Sulle Acque-CNR, Brugherio.

tartari@irsa.cnr.it

World Wide Haze

April 2001; TERRA Satellite-MODIS Inst

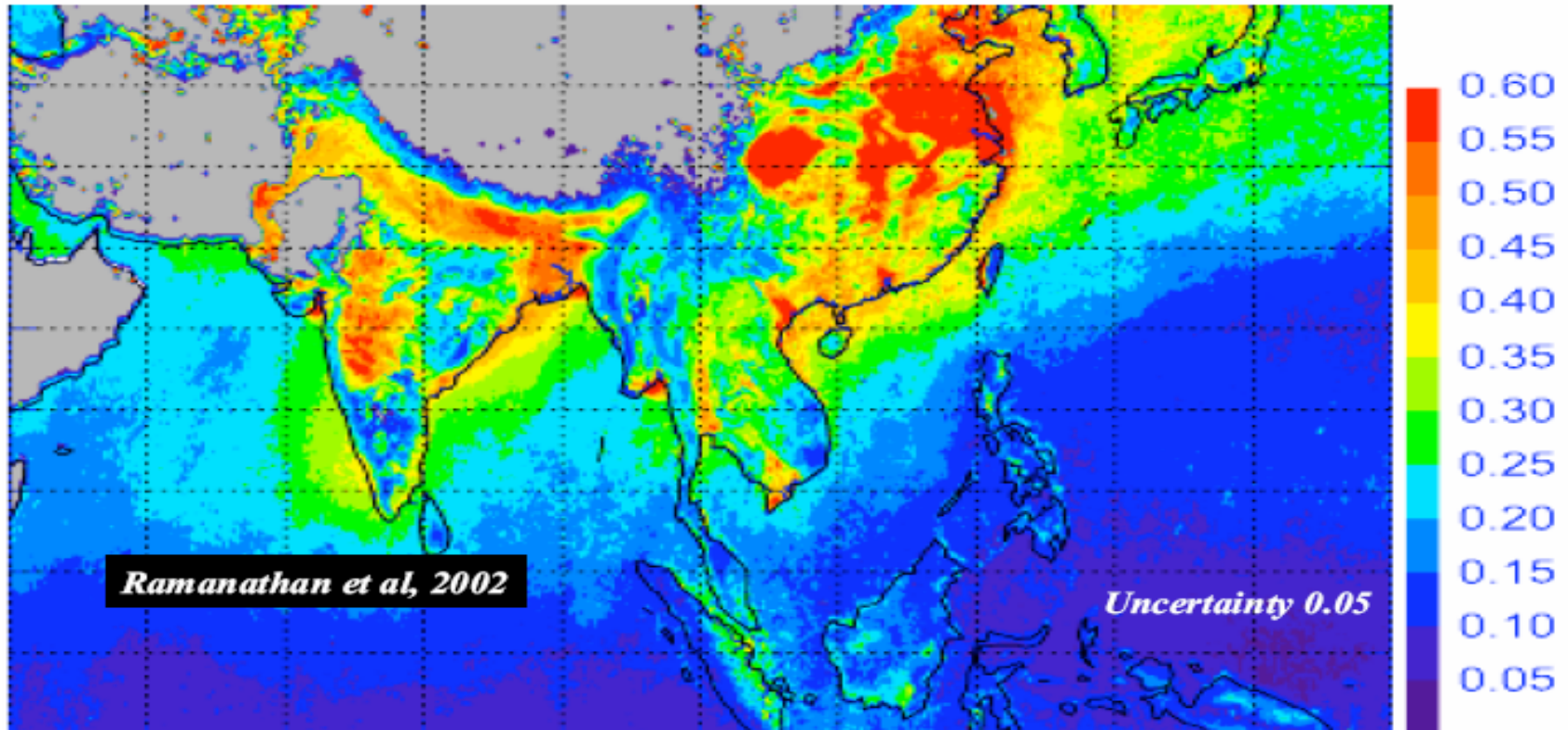


AOD (Unitless)

Ref: Y. Kaufman, 2001;
NASA-GSFC



The Atmospheric Brown Cloud over Asia
November 2000 to May 2001 from TERRA Satellite





Regions of China and India (boxes above)
shown in the following MODIS images from space



Poor air quality persists over India (left) Bangladesh (center) and Myanmar (right). This MODIS image from **January 14, 2002**, shows a thick blanket of pollution butting up against the Himalayas (top of the image) and stretching out into the Bay of Bengal (bottom).

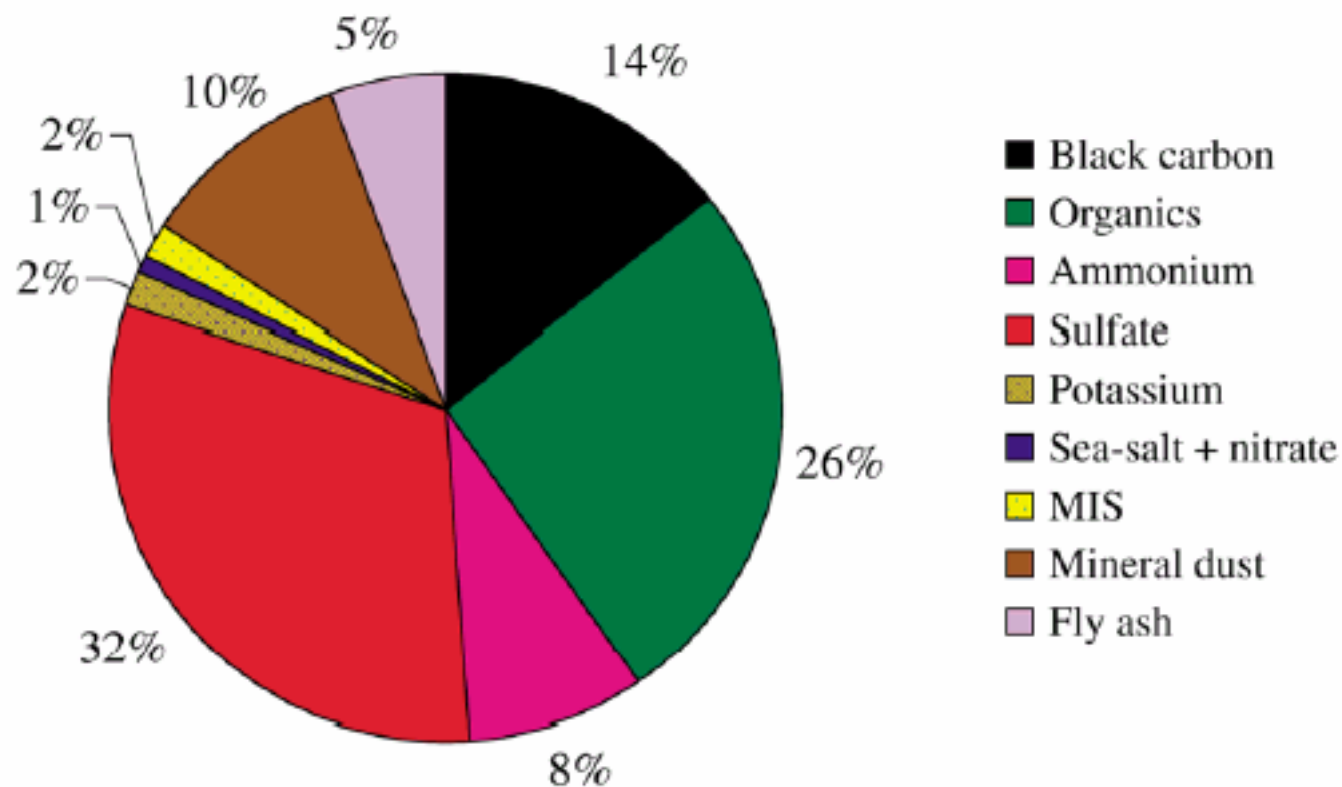
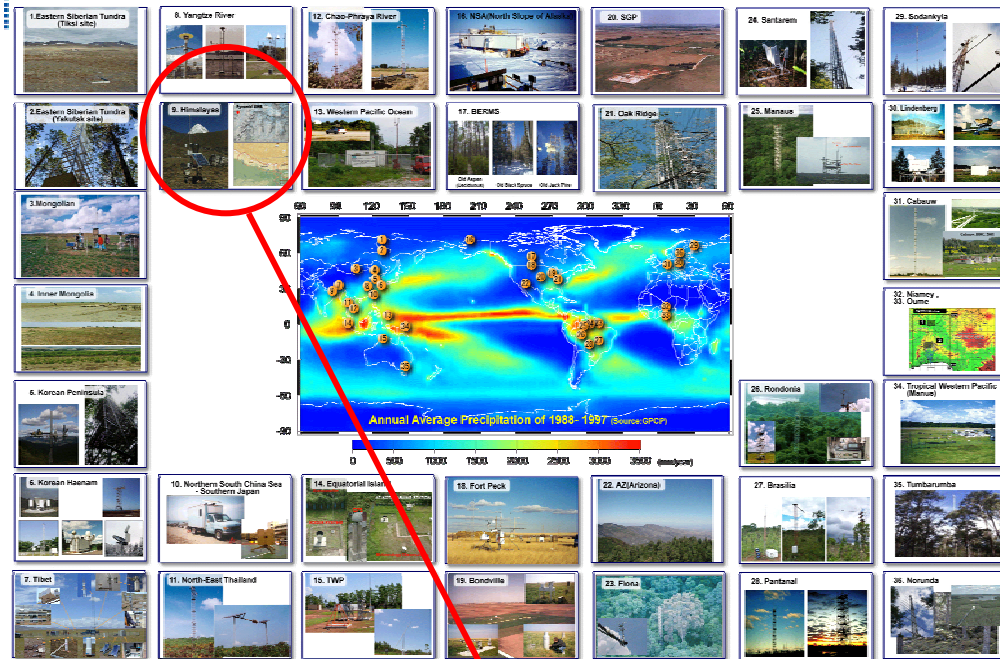


Figure 3.5: Fractional contribution of chemical components to the INDOEX aerosol, as measured over the Indian Ocean by aircraft in February and March 1999. The total mass concentration is $22 \mu\text{g}/\text{m}^3$. MIS is minor inorganic species. These are free troposphere measurements and do not include boundary layer sea-salt.

International Cooperation for the Global Coverage



<p>INTERNATIONAL PROJECTS <i>(RESEARCH & MONITORING)</i></p>
<p>WORLD METEOROLOGICAL ORGANIZATION (WMO)</p> <p>CEOP COORDINATED ENTRANCED OBSERVING PERIOD and GAW - Global Atmospheric Watch WDCGG - World Data Centre for Greenhouse Gases</p>
<p>UNITED NATIONS ENVIRONMENTAL PROGRAM (UNEP)</p> <p>ABC ATMOSPHERIC BROWN CLOUDS</p>
<p>GLIMS GLOBAL LAND ICE MEASUREMENT FROM SPACE</p>
<p>GSN GLOBAL SEISMOGRAPHIC NETWORK</p>
<p>IGS INTERNATIONAL GPS SERVICE FOR GEODINAMICS</p>
<p>LTER LONG TERM ECOLOGICAL RESEARCH</p>



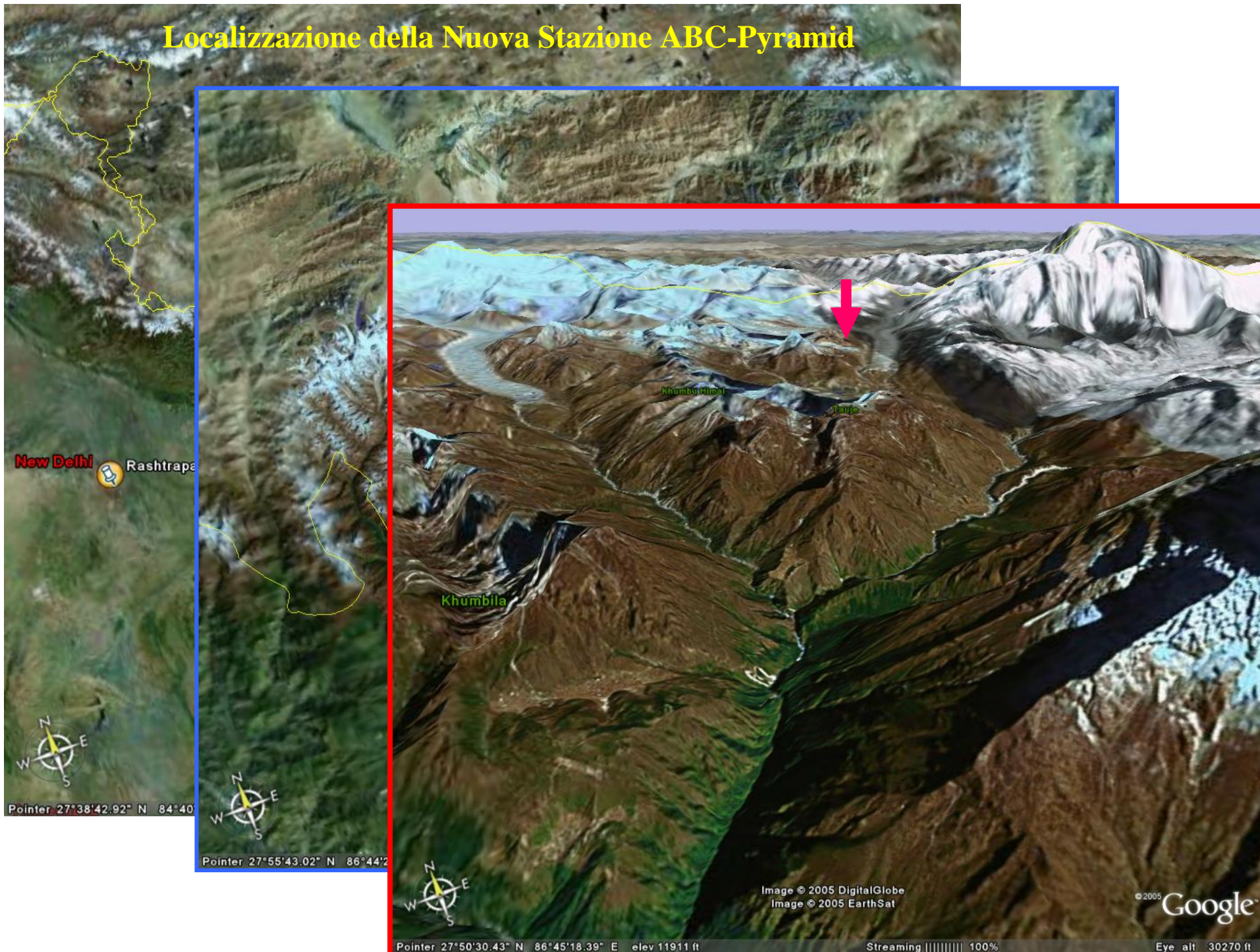
Phase 1:
2002-2004

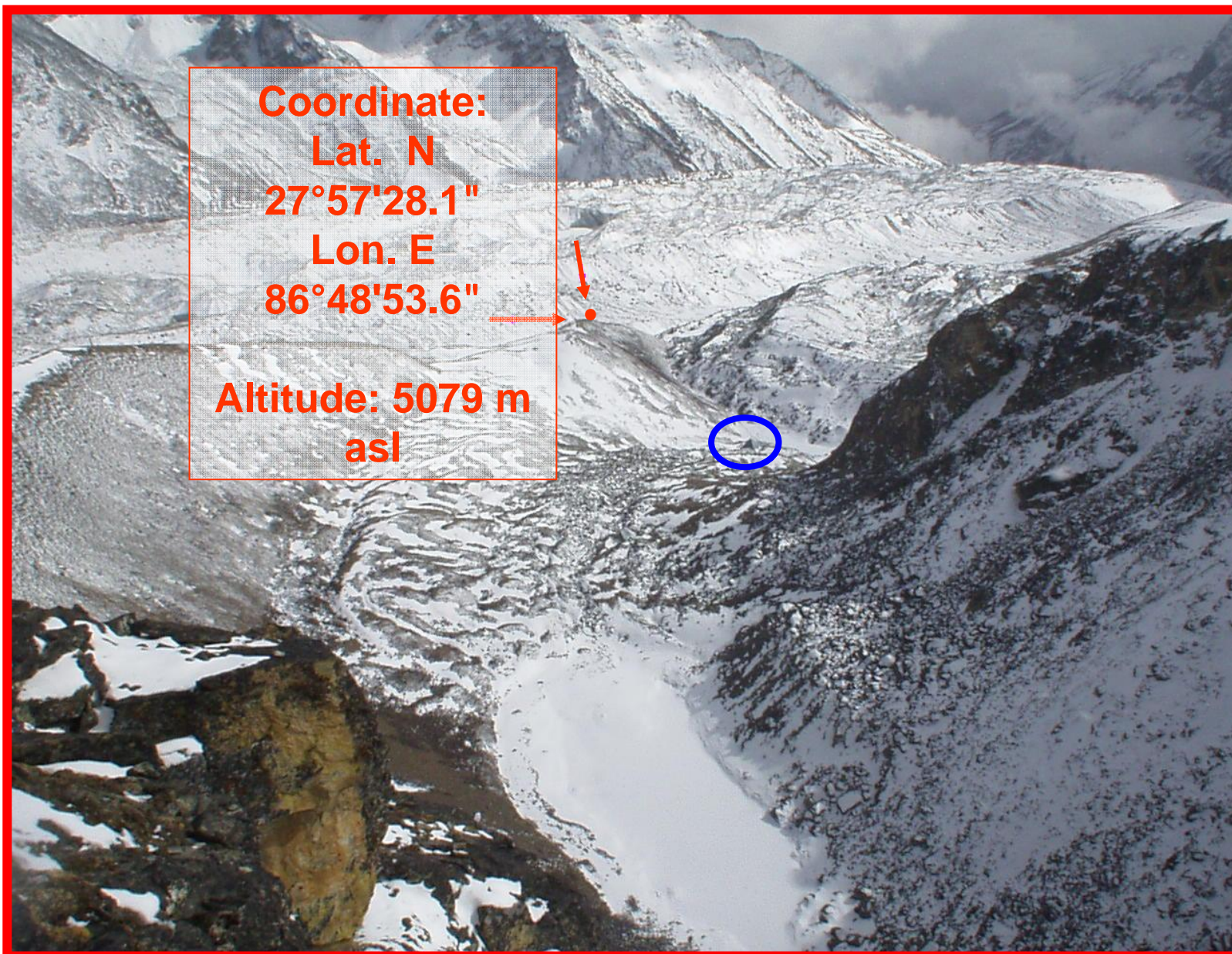
Phase 2:
2007-2010



Pointer 29°59'55.17" N 80°34'56.66" E elev 7651 ft Streaming ||||| 100%Eye alt 1209.94 mi

Localizzazione della Nuova Stazione ABC-Pyramid







Con il patrocinio di:
Ministero dell'Istruzione,
dell'Università e della Ricerca
Ministero degli Affari Esteri

è la collaborazione di:
Consiglio Nazionale delle Ricerche

Ev-K²-CNR

Prof. Paul J. Crutzen
Center for Clouds, Chemistry and Climate
Scripps Institution of Oceanography
University of California, San Diego
La Jolla, California 92093-0239
USA

Prof. Veerabhadran Ramanathan
Center for Clouds, Chemistry and Climate
Scripps Institution of Oceanography
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USA

Bergamo, February 24, 2006

Dear Prof. Crutzen and Prof. Ramanathan,

It is a great pleasure for me to announce, also on behalf of Ev-K²-CNR Committee President, Agostino De Polenza, and ABC-Pyramid chief scientist, Paolo Bonasoni, of CNR-ISAC, that the "ABC-Pyramid" station at the Pyramid Laboratory-Observatory near the base of Mt. Everest (Khumbu Valley, Nepal) has been successfully installed. All foreseen instruments have been operating at 5,079 m a.s.l. since February 19, 2006, and data are being continuously transmitted to Italy for quality control, archival and preliminary elaboration. This new "complementary site" is now ready to be inserted within the UNEP ABC network, to contribute to the study of the mechanisms concerning interaction between atmospheric brown clouds and the Himalaya chain and pollutant transport at these high altitude remote areas.

This achievement has been made possible thanks to the enthusiastic group of Italian scientists and technicians and their French and German partners, who worked for two months with a vital Nepali staff in Kathmandu and at the Pyramid, overcoming the difficulties posed by the altitude and adverse climatic conditions. Moreover, recognition is due for the fundamental contributions made over the past months by several individuals and institutions in planning station installation, including the Italian National Research Council (CNR) and the Royal Nepal Academy of Science and Technology (RONAST), and the other Italian and Nepali Ministries and Institutions that have supported us at every step.

Hopefully you share in our enthusiasm for having successfully surmounted this first challenge, just two and a half years after the Yokohama ABC Steering Committee meeting. Our appreciation must in fact also be expressed to yourselves and the ABC Science Team for having endorsed and guided us in this endeavour. We are furthermore grateful for the commitment demonstrated by Dr. Surenda Shrestha and UNEP-Asia.

We look forward to your feedback and to being in touch regarding our next steps.

Best regards,
Gianni Tartari
Dr. Gianni Tartari
SHARE-Asia Scientific Coordinator

Encl. Feb. 23 Press Release (*feel free to publish*)

Ricerche Scientifiche e Tecnologiche in Alta Quota

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Tel. +39 035 3290517 - Fax +39 035 3230557 - e-mail ev2cnr@evk2cnr.org - www.ev2cnr.org





The **ABC-Pyramid** Complementary Site



The **ABC-Pyramid** Complementary Site





ABC-Pyramid Complementary Site

Scientific responsible: Dr Paolo Bonasoni, ISAC-CNR, Bologna, Italy

Measurement	Instrument
Aerosol number concentration and size distribution (15nm to 32µm)	DMPS/SMPS, OPC-GRIMM 190
Black carbon concentration	MAAP
Total and back scattering coefficient	INTEGRATING NEPHELOMETER-TSI 3563
Aerosol optical depth	CIMEL
Surface ozone concentrations	TEI 49C
Greenhouses gas concentration (CFC, HFC, HCFC,...)	flask sampling
Chemical mass closure of aerosol	filter sampling
Meteorological parameters (air temperature, Atmospheric pressure, Relative humidity, Wind speed and direction, Precipitation)	VAISALA WAS-425

Black carbon	mg/m ³
Particelle totali	#/cm ³
O ₃	ppbv
PM 1-2,5-10	µg/m ³
Umidità relativa	%
Temperatura	°C
Vento (direzione/velocità)	gradi – m/s

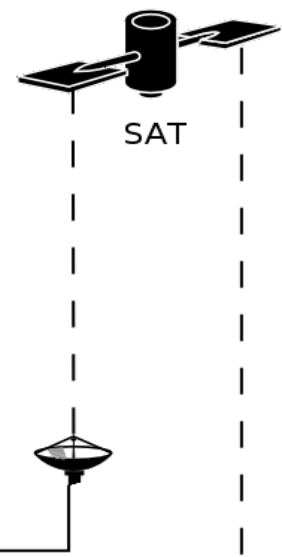
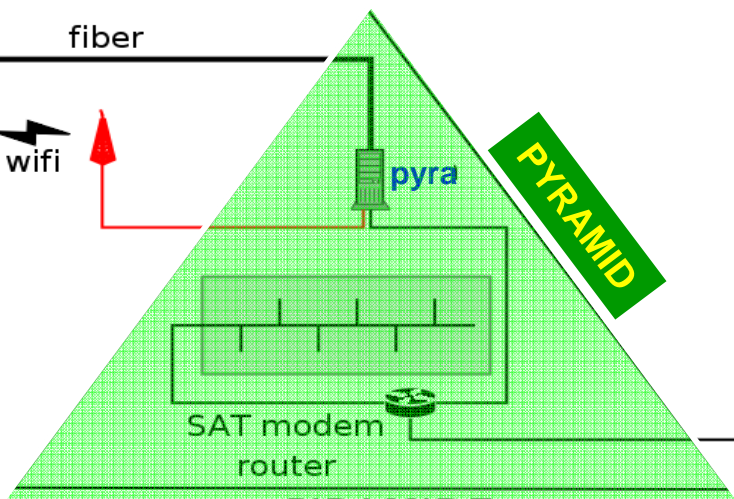
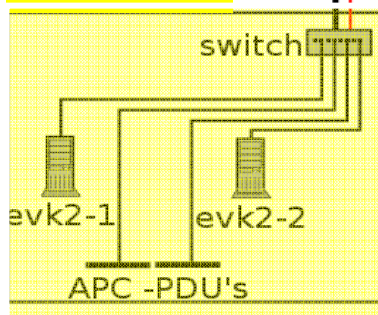
Stations at High Altitude for
SHAREASIA
 Research on the Environment



Data acquisition and communication systems

Stations at High Altitude for
SHAREASIA
 Research on the Environment

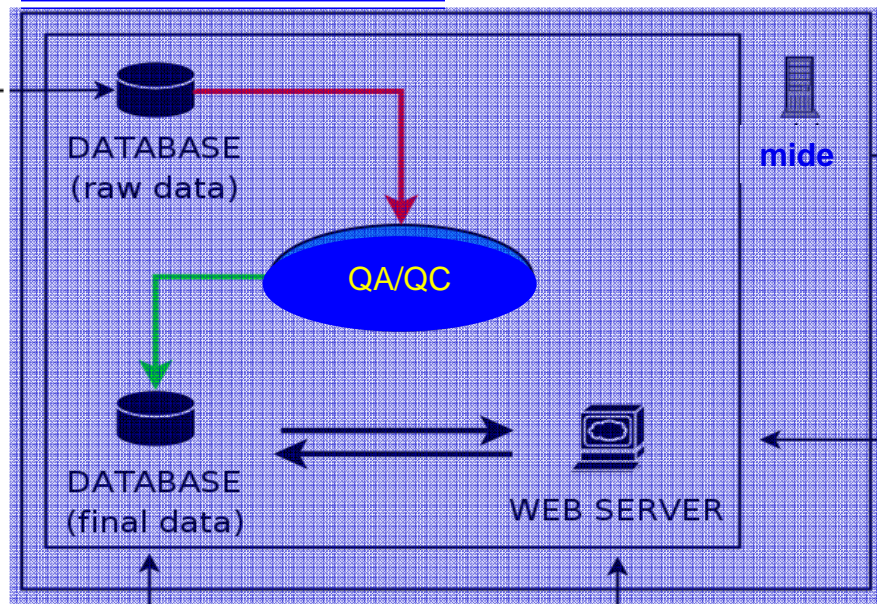
SHELTER



The data are sent to the CNR Institutes where they can be accessed by different Institutions that provide QA/QC.

CNR – ISAC Bologna

CNR-ISAC
 OPGC-CNRS
 DLR
 UNI-URB
 EV-K²-CNR



UNEP – ABC

USERS

The remote control of the instruments will be possible from CNR and CNRS Institutes.



Ev-K²-CNR Ricerca scientifica e tecnologica in alta quota

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Comitato Ev-K²-CNR
 La Piramide
 Settori di Azione
 Attività
 Cooperazione
 Pubblicazioni
 Proporre una ricerca

Meteo Nepal

IL METEO DAL TETTO DEL MONDO
 Con aggiornamenti giornalieri dalla Piramide!

Appuntamenti 2006

I convegni scientifici segnalati dai ricercatori Ev-K²-CNR

Video Ev-K²-CNR

- NEW VIDEO: Il Museo Italia-Karakorum di Skardu (PK)
- Il Laboratorio Piramide

Guarda gli altri video nella sezione Gallery

Montagna

Visita i portali italiani della montagna!

KARAKORUM TRUST special
 Stations at High Altitude for **SHAREASIA**
 Research on the Environment

SNOW LEOPARD projects
 DECISION SUPPORT SYSTEM **PARTNERSHIP**
 Hindu Kush - Karakorum - Himalaya

Progetto ABC-Pyramid

ABC Pyramid, la stazione di rilevamento atmosferico più alta del mondo, è stata installata dal Comitato Ev-K²-CNR nel febbraio 2006, ad una quota di 5.079 m.s.l.m., nei pressi del Laboratorio-Osservatorio Internazionale Piramide, in Nepal. E' stata ufficialmente riconosciuta come **Complementary Site** nel programma "Atmospheric Brown Clouds", dell'UNEP.

Le misure eseguite dalla stazione permettono di studiare la composizione dell'atmosfera nell'area Himalayana fornendo importanti informazioni sulla circolazione degli inquinanti e del particolato atmosferico nell'area dell'Asia Centrale.

Dal 16 marzo 2006 i **dati** raccolti da ABC-Pyramid, sono **consultabili online, in tempo reale**, grazie ad un sistema ad altissima tecnologia che collega la Piramide all'Istituto Isac-Cnr di Bologna.

storia di un'installazione ad alta quota
 photogallery ABC Pyramid

[leggi tutto](#)

LATEST NEWS

Gira su se stesso, si muove puntando lo sguardo attento verso il cielo terso che sovrasta l'Himalaya. Evk2cnr.org vi offre uno straordinario video del sensore CIMEL in azione, mentre rileva preziose informazioni sulla circolazione degli aerosol. [\(leggi\)](#)

CONSULTA I DATI ON LINE

A scientific laboratory for the study of atmospheric composition change and climate

08-06-2006 Convegno web sulla biodiversità

<http://www.evk2cnr.org/>



A scientific laboratory for the study of atmospheric composition change and climate

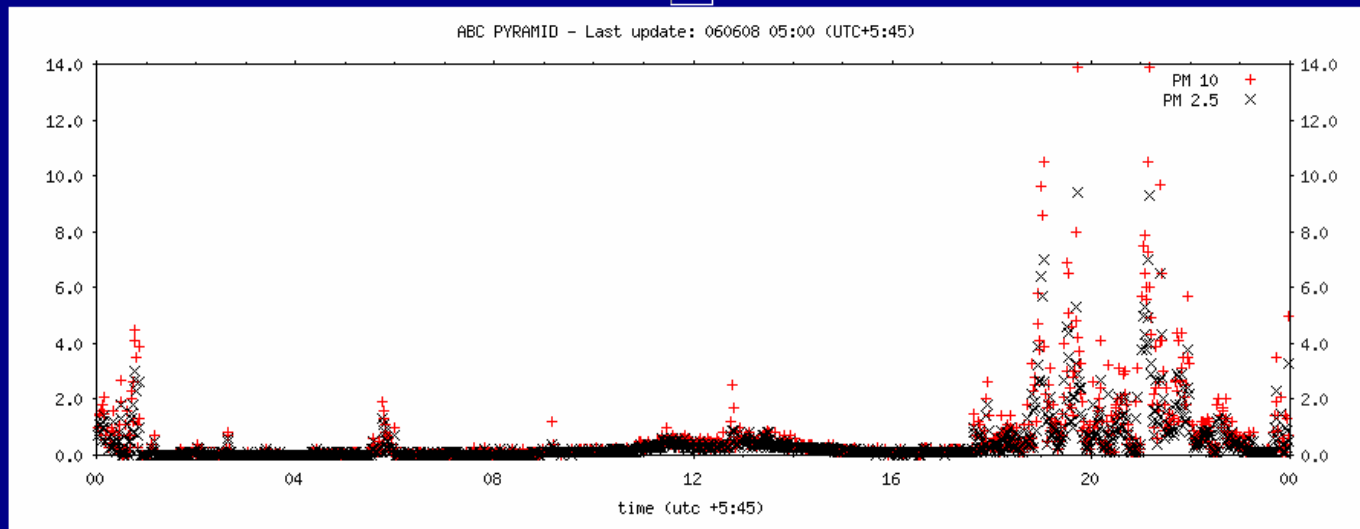
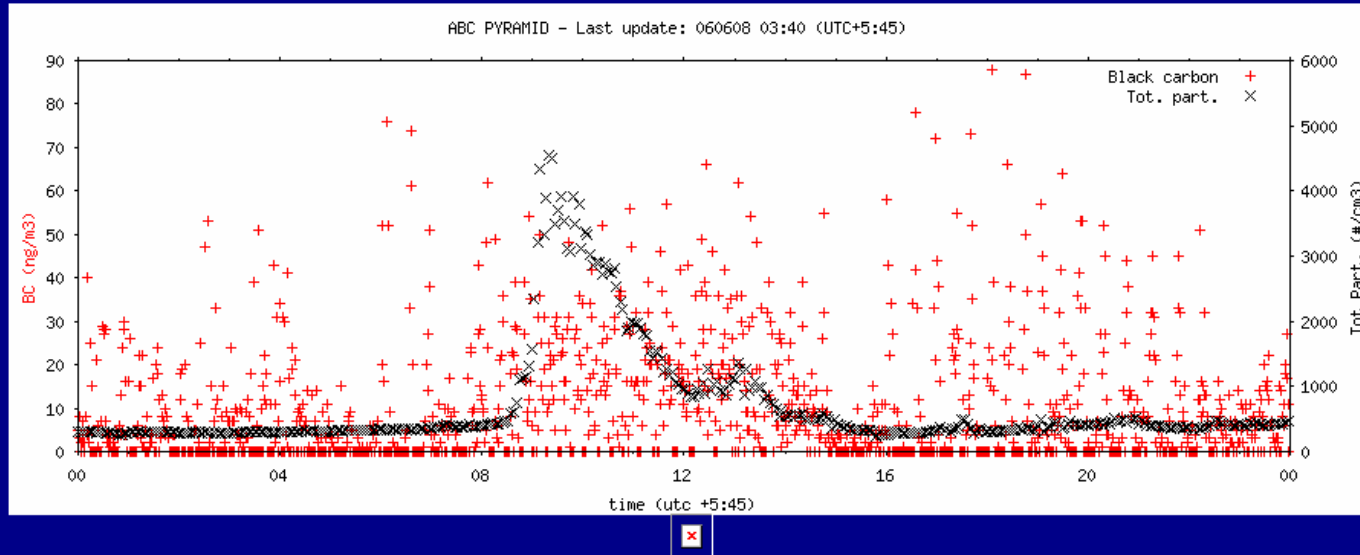
- home
- the laboratory
- weather and satellites
- trj forecast
- ste forecast
- publications
- real time data

- Project description
- Participants
- Links



ABC-PYRAMID REAL TIME DATA

The following graphs are plotted using raw and unscreened data and may not have final calibration applied






http://evk2.isac.cnr.it/h_partecipants.html - Microsoft Internet Explorer

File Modifica Visualizza Preferiti Strumenti ?

Indietro - Cerca Preferiti

Indirizzo http://evk2.isac.cnr.it/h_partecipants.html Vai Collegamenti Google Norton AntiVirus

ISAC EVK2



A scientific laboratory for the study of atmospheric composition change and climate

home the laboratory weather and satellites trj forecast ste forecast publications real time data

Project description
Partecipants
links

- [CNR - Institute for Atmospheric Sciences and Climate, Bologna-Roma, Italy](#)
P. Bonasoni (**Chief Scientist**), A. Marinoni, U. Bonafè, F. Calzolari, P. Cristofanelli, MC. Facchini, S. Fuzzi, GP. Gobbi, F. Roccato
- [CNRS - Université Blaise Pascal, Aubière Cedex, France](#)
P. Laj (**Co-Chief Scientist**), H. Venzac, JM. Pichon, K. Sellegri, P. Villani
- [Urbino University, Department of Environmental Science, Urbino, Italy](#)
M. Maione, J. Arduini
- [DLR - Institute of Atmospheric Physics, Wessling, Germany](#)
A. Petzold
- [ETHZ - Swiss Federal Institute of Technology, Zurich, Switzerland](#)
M. Sprenger
- [EV-K²-CNR Committee, Bergamo, Italy](#)
GP. Verza, G. Tartari, E. Vuillemoz

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