

# Concept of DUST-2

Gerd K. Hartmann<sup>(1)</sup>, Andreas Nölle<sup>(2)</sup>, Michael Richards<sup>(3)</sup>, Reinhart Leitinger<sup>(4)</sup>

## DUST-2: An interactive graphic linkage of texts and data, applied to ozone and water vapor and other selected data of the Earth's atmosphere.

The expected strong increase of atmospheric data e.g. by ESA's ENVISAT (Environmental Satellite, launch 2001) will be a great challenge for all relevant data base systems. These data are important for studies on climatic changes. Ozone data are especially essential because of the influence of the UV radiation on the biosphere including humans. Graphical tools providing an obvious and intuitive interface to the data, both numerical and textual get increasingly important for data bases, proportional to the magnitude of the data flux. They assist in exploring, selecting from, and searching the database. They have been combined and investigated in context with a pilot project for the validation of atmospheric data, carried out at the Max-Planck-Institut fuer Aeronomie (MPAE) in Katlenburg-Lindau, Germany and supported by DLR (Fkz. 50 EE 98038 from 01.01.1998 – 31.08.2000). These facilities can be used to prepare and to publish, in principle, any database. Here, classical and modern documentation methods – comprising data classification, storage and retrieval – and validation methods for selected data and texts of the earth's atmosphere can be interactively graphically linked and the results displayed. The software functionality includes visualizations, animation and mathematical statistical processing and allows to reveal ozone trends or to ascertain differences between data sets.

DUST-2 will be available as a CD-ROM version in August 2000 from the Copernicus Gesellschaft in Katlenburg-Lindau ([www.copernicus.org/EGS/EGS.html](http://www.copernicus.org/EGS/EGS.html)).

This DUST-2 CD-ROM is a result of the above mentioned pilot project, and is intended to show the synergy of the graphical linkage between relevant texts and data and should help to improve the present insufficient availability of qualified filtered, direct useable information. It should further initiate and support related learning processes.

On the CD-ROM in an introductory chapter the concept is presented with graphics and texts accompanied by some basic articles and a glossary in English and German. Further information is available at :

[www.science-softCon.de](http://www.science-softCon.de)

### DUST-2 history

In 1985 the planning of a "Landolt Börnstein data handbook" has been started by the editors W. Dierminger, G. K. Hartmann, and R. Leitinger under the topic: "The physics of the upper atmosphere". Because of the large amount of time series data and their increasing growth rates the issue was planned in two printed volumes accompanied by a CD-ROM, i.e. a so called mixed media, which was supposed to be updated about every two years. Many authors contributed to this enterprise, but it failed after several years because of copyright problems with the data and because it was obviously too early for "selling" such mixed media to the public. The editors got finally the introductory text parts of the contributions published in 1996 under the title "The Upper Atmosphere: Data Analysis and Interpretation", ISBN 3-540-57562-6, Springer-Verlag Berlin, Heidelberg New York, 1996. The present DUST-2 concept can be regarded as the continuation of that attempt, however, making use of the advanced information technology from the hardware as well as from the software side.

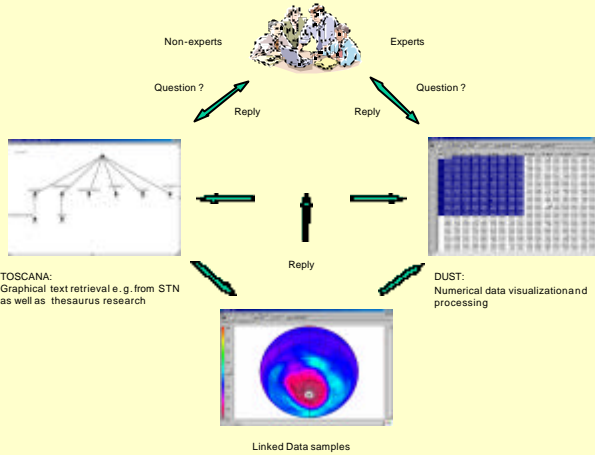


Fig. 1: Concept of DUST-2, graphical interactive linking of texts with data

### Table 1: Content of the DUST presentation

Poster	Topic
Left 4	Data validation with examples Part 1: Formal concept analysis for data retrieval and validation Part 2: Use of neural network method in H <sub>2</sub> O data validation Part 3: MAS/GRAS combined retrieval
Left 3	TEC and Space Weather Part 1: Selected TEC examples Part 2: Space Weather
Left 2	DUST 1.5: Interactive data visualization Part 1: Interactive processing of atmospheric data Part 2: New search method S4
Left 1	DUST 1.5: General aspects
Projector Screen	
Right 1	Concept of DUST-2
Right 2	Retrieval comparison from various text sources Part 1: O <sub>3</sub> and H <sub>2</sub> O retrieval from STN; INSPEC, Energy Data Base and Web of Science Part 2: Conference abstract retrieval from EGS 2000
Right 3	DUST-2 and thesaurus research Part 1: Linkage of TOSCANA with DUST
Right 4	New text retrieval methods Part 1: SOMAccess: Data mining applied to STN and EGS 2000 abstracts

Further information on DUST-2 project is available at: <http://www.science-softCon.de>

### Table 2: Alphabetic list of Authors:

Behr, P. Science Softline, Johanna Tesch Platz 9, D-60386 Frankfurt	Peter.Behr@Science-Softline.de
Hartmann, G. K. DLR-Neustrelitz, Kalkhorstweg 53, 17235 Neustrelitz	Ghartmann@linmpi.mpg.de
Jarkow, Ch. MPAE, Max-Planck-Str. 2, D-37191 Katlenburg-Lindau	jakowskib@z.dlr.de
Kirchengast G. IGAM/Uni Graz, A-8010 Graz, Austria	g.kirchengast@kfunigraz.ac.at
Klose, A. Uni Magdeburg, Universitätsplatz 2, D-39106 Magdeburg	Alojsha.Klose@cs.uni-magdeburg.de
Kollewe, W. Nav/Con GmbH, Heinrichstr. 9, D-60327 Frankfurt	Kollewe@navicon.de
Kruse, R. Uni Magdeburg, Universitätsplatz 2, D-39106 Magdeburg	Rudolf.Kruse@cs.uni-magdeburg.de
Leitinger, R. IGAM/Uni Graz, A-8010 Graz, Austria	Reinhart.Leitinger@kfunigraz.ac.at
Nölle, A. science-softCon, Auf der Burg 4, D-63477 Maintal	Andreas.Noelle@science-softcon.de
Nürnbergger, A. Uni Magdeburg, Universitätsplatz 2, D-39106 Magdeburg	Andreas.Nuernbergger@cs.uni-magdeburg.de
Oberländer, H. WT-Dokumentation, Stettiner Str. 6, D-37431 BadLauterberg	ger.d.o@online.de
Ofermann, D. Phys. Dept. Uni Wuppertal, Gaußstr. 20, D-42097 Wuppertal	ofermann@wps2.physik.uni-wuppertal.de
Putz, E. IGAM/Uni Graz, A-8010 Graz, Austria	Erich.Putz@kfunigraz.ac.at
Ramsauer, J. IGAM/Uni Graz, A-8010 Graz, Austria	Gottfried.Kirchengast@kfunigraz.ac.at
Richards, M. L. CG e.V., Max-Planck-Str. 13, D-37191 Katlenburg-Lindau	Richards@linmpi.mpg.de
Richter, A. CG e.V., Max-Planck-Str. 13, D-37191 Katlenburg-Lindau	AKRichter@linmpi.mpg.de
Sackmeyer, G. Institut für Meteorologie, Uni Hannover, D-30419 Hannover	sackmeyer@imk.uni-hannover.de
Skorsky, M. Nav/Con GmbH, Heinrichstr. 9, D-60327 Frankfurt	Skorsky@navicon.de
Taalas, P. FMI, POB 503, 00101 Helsinki, Finland	petteri.taalas@fmi.fi
von Engeln, A. IFE Uni Bremen, D-28334 Bremen	kuenz@physik.uni-bremen.de
Weber, K. H. FIZ Karlsruhe, D-76012 Karlsruhe	kw@FIZ-Karlsruhe.DE
Wilhelms, H. WebFormatting, Hugo-Weiss Straße 102, D-81927 München	Hartmut.Wilhelms@t-online.de
Wolff, K.E. FH Darmstadt, FB Mathematik, Schöfferstr. 3, D-64295 Darmstadt	Wolff@mathematik.uni-darmstadt.de
Zickhoff, M. Nav/Con GmbH, Heinrichstr. 9, D-60327 Frankfurt	Zickhoff@navicon.de

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### Acronyms

AUC	ATMOS User Center
CG	Copernicus Gesellschaft e.V
CRISTA	Cryogenic Infrared Spectrometers and Telescopes for the Atmosphere
DARA	Deutsche Agentur für Raumfahrtangelegenheiten
DFD-DLR	Deutsches Fernerkundungszentrum des Deutschen Zentrums für Luft- und Raumfahrt
DUST	Data Utilization Software Tools
FIZ	Fachinformationszentrum Karlsruhe
FMI	Finnish Meteorological Institute
GRAS	GPS/GLONASS receiver
IGAM	Institute of Geophysics, Astrophysics, and Meteorology
MAS	Millimeter wave Atmospheric Sounder
MPAE	Max-Planck-Institut für Aeronomie
NASA	National Aeronautics and Space Administration
NOAA	National Oceanic and Atmospheric Administration
S4	Search (in four dimensions)
SEC	Space Environmental Center, NOAA
SOM	Self-Organizing Map (Kohonen feature map)
STN	Scientific & Technical Information Network
TEC	Total Electron Content (of the ionosphere)
WDC-A-STP	World Data Center-A Solar-Terrestrial Physics, NOAA

**Availability of DUST-2 CD-ROM on a non-profit basis for the amount of 12 (twelve) EURO (shipping, handling) DUST-2 will be available in August 2000 upon request at:**

Copernicus Gesellschaft e.V.  
EGS Office  
Max-Planck-Str. 13  
D-37191 Katlenburg-Lindau  
Germany  
Tel: +49-5556-1440  
Fax: +49-5556-4709  
E-mail: [egs@copernicus.org](mailto:egs@copernicus.org)  
URL: [www.copernicus.org/EGS/EGS.html](http://www.copernicus.org/EGS/EGS.html)

### Modes of payment:

1. Cheques are accepted in EURO (EUR), Deutsche Mark (DEM), Pound Sterling (GBP) and US Dollars (USD), but only if cheque fee of the equivalent of 4,- EURO is included and if the cheque is written in the currency of the country of the bank on which the cheque is actually drawn!
2. By bank transfer to Copernicus e.V. Account No. 11 33 222, Sort Code (BLZ) 260 700 72, Deutsche Bank, 37154 Northeim, Germany. All bank charges must be borne by remitter.
3. Credit card: VISA, Euro-Card/Master-Card, American Express, Order with Card-Number, Expiration date and Card-Holder Name.

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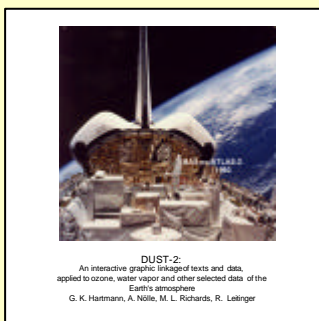


Fig. 2: Front cover of DUST-2 CD-ROM

### Future aspects:

It is planned to continue and further develop this tool together with the listed and/or new partners. Fund raising from governmental and non-governmental sources for future activities will soon be started. More details will be published in Physics and Chemistry of the Earth. For general information see

<http://www.science-softCon.de> <http://www.linmpi.mpg.de/englishprojekte/masnew>

Please send comments and requests for handouts to: [DUST-2@science-softCon.de](mailto:DUST-2@science-softCon.de)

### Contact

Prof. Dr. Gerd K. Hartmann, (Principle Investigator) <sup>(1)</sup>  
Max-Planck-Institut für Aeronomie  
Max-Planck-Straße 2  
D-37191 Katlenburg-Lindau  
Internet: [www.linmpi.mpg.de](http://www.linmpi.mpg.de)

Dr. Andreas Nölle, (Technical Realization and Management) <sup>(2)</sup>  
science-softCon  
Auf der Burg 4  
D-63477 Maintal  
[www.science-softCon.de](http://www.science-softCon.de)

Dr. Michael Richards, (Data Validation) <sup>(3)</sup>  
Copernicus Gesellschaft e.V.  
Max-Planck-Straße 13  
D-37191 Katlenburg-Lindau  
[www.copernicus.org](http://www.copernicus.org)

Prof. Dr. Reinhart Leitinger, (TEC and Space Weather) <sup>(4)</sup>  
IGAM Universität Graz  
Halbärb. Str. 1  
A-8010 Graz  
[www.igam.ac.at](http://www.igam.ac.at)