GhoSSTDM
GhoSSTHADE

Solid Spectroscopy Data Bases

SSDM: *the Data Model*

SSHADE: *the Hosting Architecture of Databases*

GhoSST: *the first Database in Grenoble for Astrophysics and Planetology*

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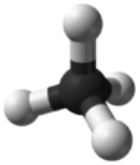
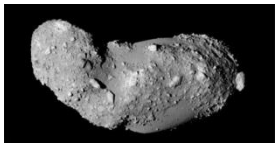
SSDM General Structure

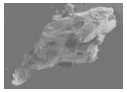


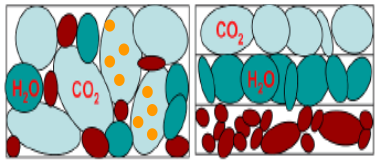
SPECIES

MATTERS

OBJECTS

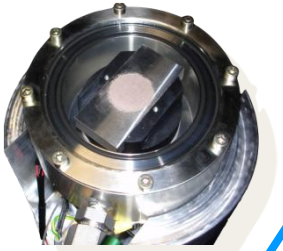




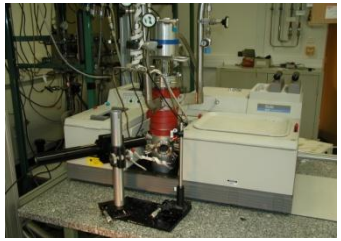


SAMPLE

INSTRUMENT

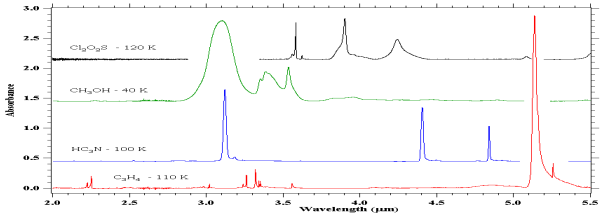


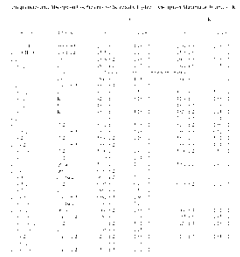
EXPERIMENT



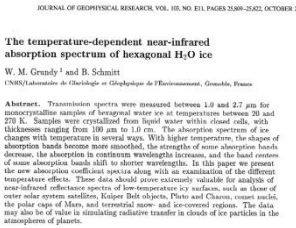
BAND LIST

SPECTRA





PUBLICATIONS



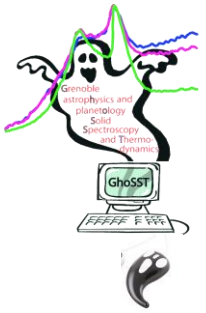
JOURNAL OF GEOPHYSICAL RESEARCH, VOL. 105, NO. E11, PAGES 25,889–25,922, OCTOBER 25, 1998

The temperature-dependent near-infrared absorption spectrum of hexagonal H_2O ice

W. M. Grundy[1] and B. Schmitt

CNRS/Laboratoire de Glaciologie et Géophysique de l'Environnement, Grenoble, France

Abstract. Transmission spectra were measured between 1.0 and 2.7 μm for monocrystalline samples of hexagonal water ice at temperatures between 20 and 270 K. Samples were crystallized from liquid water within closed cells, with thicknesses ranging from 100 μm to 1.0 cm. The absorption spectrum of ice changes with temperature in several ways. With higher temperature, the shapes of absorption bands become more smoothed, the strengths of some absorption bands decrease, the absorption in continuum wavelengths increases, and the band centers of some absorption bands shift to shorter wavelengths. In this paper we present the new absorption coefficient spectra along with an examination of the different temperature effects. These data should prove extremely valuable for analysis of near-infrared reflectance spectra of low-temperature icy surfaces, such as those of outer solar system satellites, Kuiper Belt objects, Pluto and Charon, comet nuclei, the polar caps of Mars, and terrestrial snow- and ice-covered regions. The data may also be of value in simulating radiative transfer in clouds of ice particles in the atmospheres of planets.



Hosting Solid Spectroscopy data of European Data Providers: *SSHADE*

***SSHADE* :**

"Solid Spectroscopy Hosting Architecture of Databases and Expertise"

- Based on the ***GhoSST*** database developments (Europlanet + VAMDC)

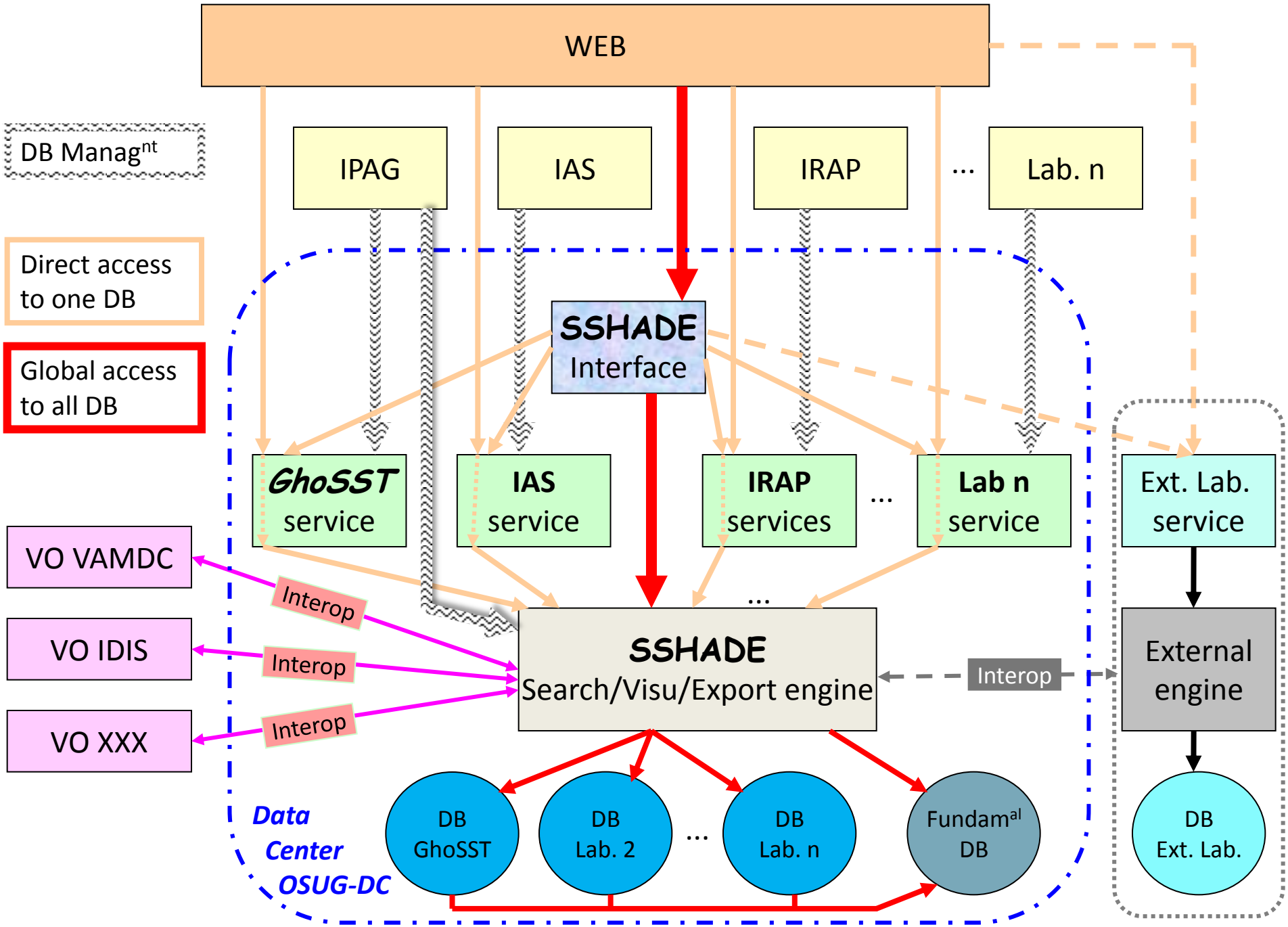
  => http://ghosst.osug.fr

- Made of:
  - ✓ A 'solid spectroscopy' interface
  - ✓ A Search/Visualization/Export engine
  - ✓ A set of databases: one per laboratory (GhoSST is one of them)
  - ✓ A common fundamental database

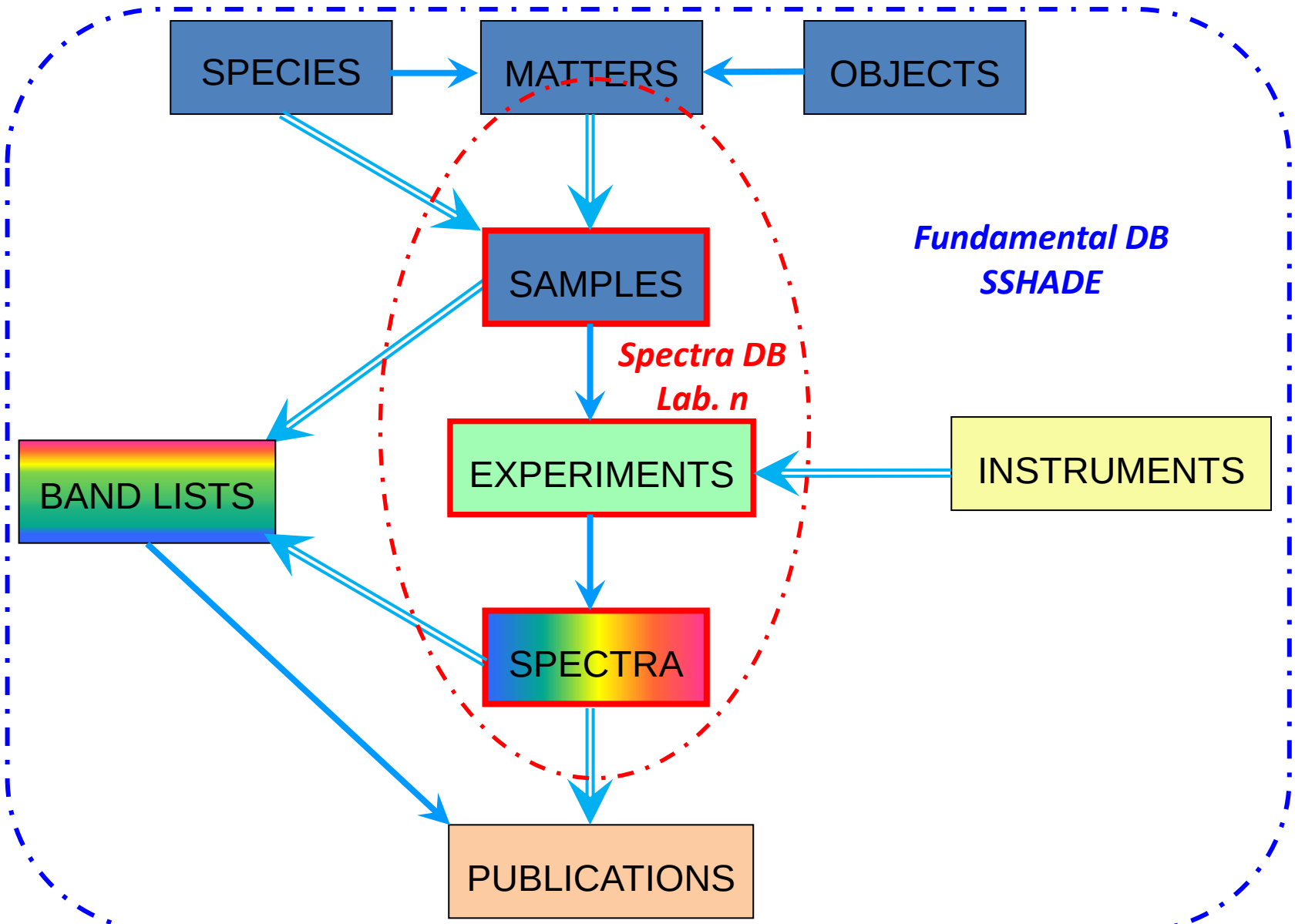
- Also direct link to each individual DB web page (powered by SSHADE)

- All hosted at OSUG data center (OSU Grenoble - UJF)

- SSHADE will be a client of others VO (Europlanet-VO, VAMDC, ...)


WEB
DB Managnt
IPAG
IAS
IRAP
...
Lab. n
Direct access to one DB
Global access to all DB
SSHADE Interface
GhoSST service
IAS service
IRAP services
...
Lab n service
Ext. Lab. service
VO VAMDC
VO IDIS
VO XXX
Interop
Interop
Interop
...
SSHADE Search/Visu/Export engine
Interop
External engine
DB GhoSST
DB Lab. 2
...
DB Lab. n
Fundamal DB
DB Ext. Lab.
Data Center OSUG-DC

SSHADE: new SSDM Structure



SSHADE: Development at IPAG

- **To be done:**
  - **Reorganization of databases**
    - common fundamental part (SSHADE) + specific parts (LABOS)
    - rewritting data queries (multi DB)
    - SSHADE web page + links
  - **Creation of one database per Lab**
    - database + local Web page + links
    - search and info pages adaptative to DB content
  - **Tools for easier data import**
    - data entry interfaces (responsive) to create xml import files
    - validation tools
  - **VO interoperability**
    - EPN-TAP + VAMDC-TAP layers for VO access
    - VOTables with main DB content
  - **Formation of data producers**
    - preparation and validation of data
    - feeding and managing of their own database

SSHADE: work at each laboratory / group

- **Data producers**
  - record spectral data
  - analysis of data
- **Data base manager**
  - prepare and test import files (all types)
  - import data (sample, spectra, matters) + corrections
  - report bugs, data errors and improvements
- **Scientific manager**
  - validation of data
  - animation of his data base

The SSHADE-EU Labs: 15 (8 french)

French

- IPAG / Planéto (Bernard Schmitt, Lydie Bonal, Damien Albert)
- IAS (Emmanuel Dartois, Donia Baklouti)
- IRAP / GPPS (Patrick Pinet, Serge Chevrel)
- IRAP / MICMAC (Karine Demyk)
- LPGN (Yann Morizet, Manuel Giraud)
- LISA / Univ. Paris-EST (Nicolas Fray)
- PIIM (Patrice Theulé)
- LATMOS / IMPEC (Nathalie Carrasco)
- LGL / ENS-Lyon (Isabelle Daniel, Bruno Reynard)

Europeans

- Open University - UK (Nigel Mason)
- Catania Astrophysical Observatory, INAF - It (G. Leto, M. Munari)
- IAPS – Rome *(Dip. di Scienze Applicate, Univ. di Napoli)* - It (A. Rotundi)
- Space and Planetary Science Division, Univ. of Bern - CH (A. Pommerol)
- AIU Observatory, Jena D. (H. Mutschke) [DOCCD 'database']
- Centro de Astrobiología, INTA-CSIC – E (G. Muñoz Caro)
- Instituto de Estructura de la Materia, Madrid – E (V. Timón)
- ...

Data of SSHADE

- **Spectral ranges:**
  - from VUV to sub-mm

- **Solids:**
  - Ices (low to high pressure, low to room temperature, mixtures, matrix isolated, ...)
  - clathrates hydrates, hydrates
  - minerals (natuels and synthesized), rocs
  - organic matter (natural and syntetized), polymers, VUV
  - Extraterrestrial matter: meteorites, IDPs, ...
  - also liquids (organics, ...)

- **Data types:**

➢ **Spectra**
  - infrared transmission spectra, absorption coefficients, optical constants
  - Raman spectra et micro-spectroscopy
  - reflectance spectra of surfaces, spectro-photometric functions
  - multispectrale and multi-angular Imagery of surfaces

➢ **Bandlist**
  - position, width, intensity, attribution ... for molecular solids

SSHADE Project

- **Done:**
  - 2012: proposition of SSHADE to INSU/CNRS w. 5 French laboratories
  - 2013: GhoSST get label from INSU/CNRS SO5
    Recommendation from INSU/CNRS to develop SSHADE
  - 23/10/2013: 1st meeting of SSHADE-France (IPAG, Grenoble)

- **Project:**
  - Feb. 2014 : **first SSHADE-Europemeeting**
  - 2014: start 2-3 new DataBases (in pre-SSHADE structure)
  - mid-2014: start preliminary study of SSHADE infrastructure
  - sept. 2014 *Horizon 2020: EPN(VO)* proposal
  - 2016/17: **develop SSHADE infrastructure**
    (if Horizon 2020 funding)
  - 2016/17: **open SSHADE DataBases to 'data producers'**