60 ppd SOLAR ALBEDO GLOBAL MAP OF MARS FROM OMEGA/MEX

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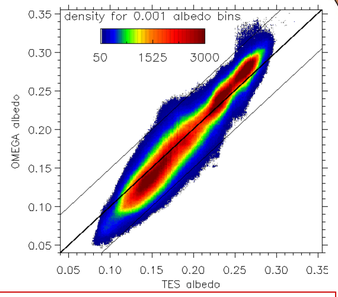
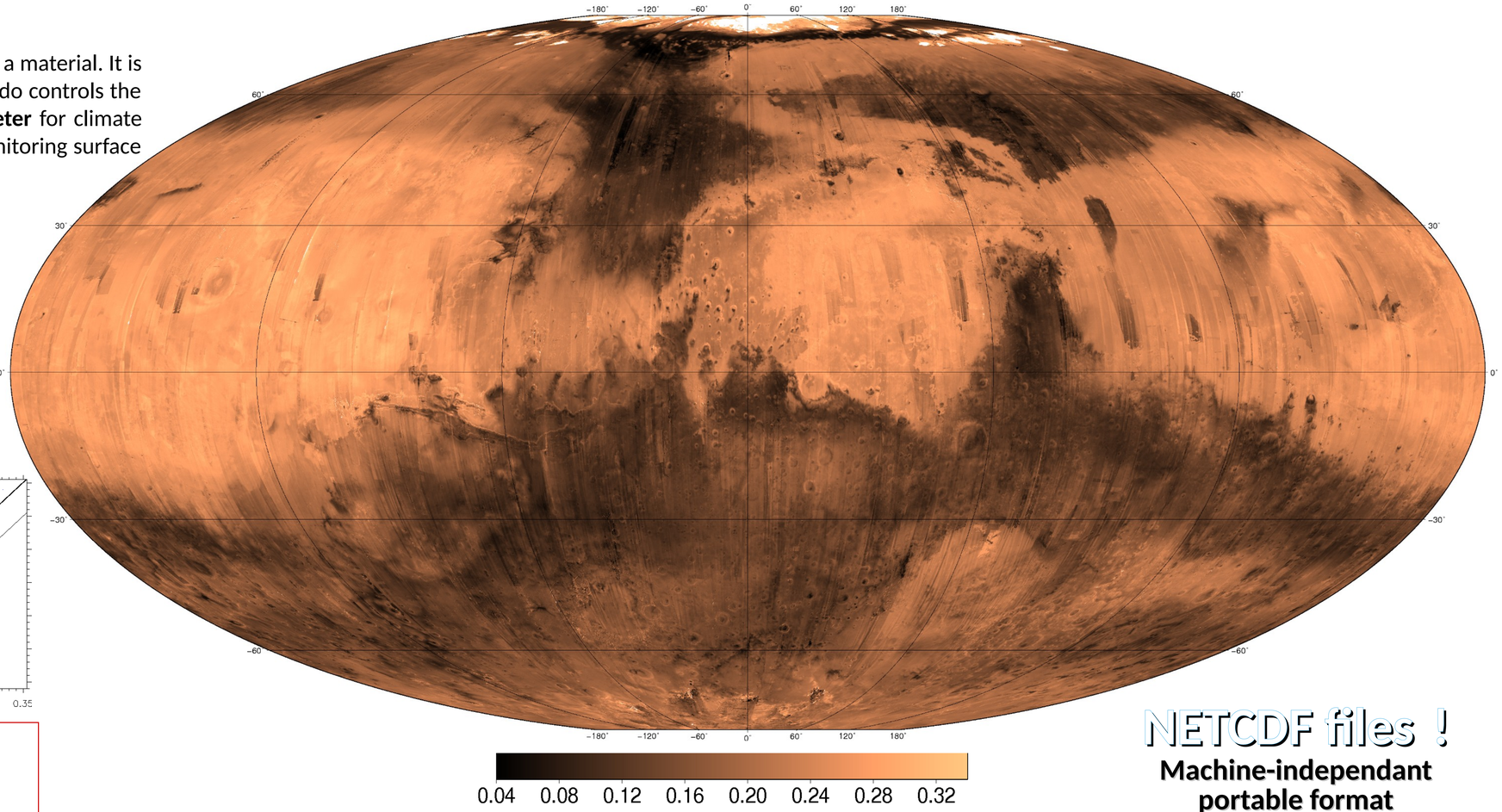
Solar albedo

Solar albedo is defined as the **fraction of the solar energy reflected** by a material. It is the sum of the surface reflectance over the solar spectrum. Solar albedo controls the **energy budget** of the Martian surface and is therefore a **key parameter** for climate modeling and energy budget computation. It is also important for monitoring surface changes (e.g. Putzig and Mellon, 2007b ; Vincendon et al., 2015) and for deriving thermal inertia (e.g. Fergason et al. 2006 ; Audouard et al., 2014). A radiometrically **accurate and finely resolved global map** of this parameter is needed.

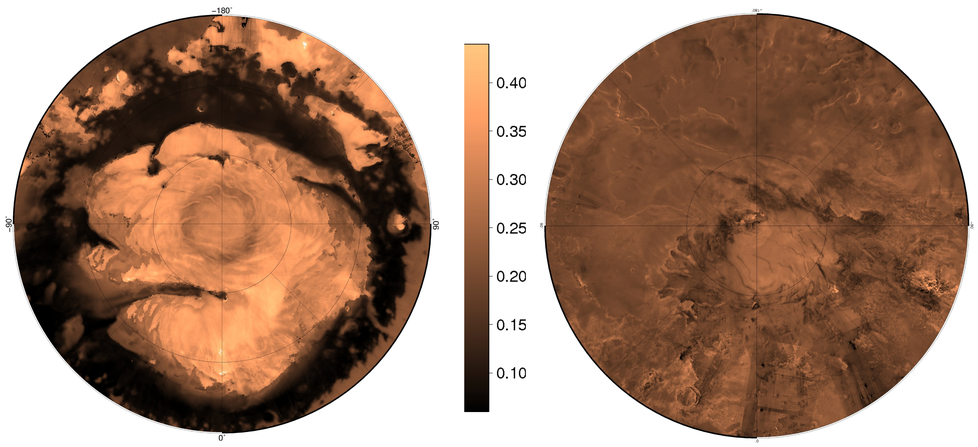
We use **OMEGA** data bewteen **0.43 and 2.5 µm** (300m-5km spatial resolution) and **HST STIS UV data** (0.25-0.43µm, Bell and Ansty, 2007)) to compute a radiometrically accurate solar albedo (**absolute uncertainty** is about **10%**). The least perturbated spectra are selected (no clouds, no ice, low dust in the atmosphere, high SNR) and are corrected from instrumental effects, atmospheric attenuation, ariborn dust scattering to produce reliable solar albedo values. **See Vincendon et al., 2015**.

We present **new global maps of the Martian surface solar albedo**. They have been build at a resolution of **60 ppd** (~ 1km/pixel at the equator, **21600x10800** pixels globaly, i.e. 3 times the TES-based maps). These maps are distributed to the community in **handy NETCDF format : download them now** !





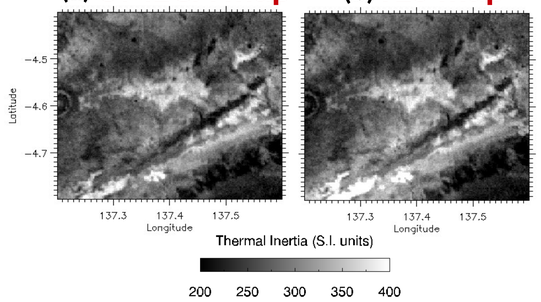
*Mars surface solar albedo derived from **OMEGA** data (filled at 94.8%, **Vincendon et al., 2015**) and completed using **TES** albedo map (**Putzig and Mellon, 2007b**). Mollweide projection (above) and general stereographic views of the poles (below).*



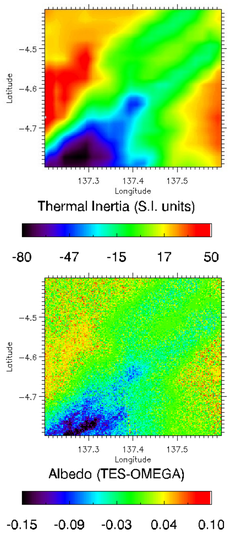
Impact on Thermal Inertia retrievals

Using as albedo :

(a) OMEGA map (b) TES map



(b)-(a) :



Mosaic of Gale Crater thermal inertia from THEMIS observations I48469001, I48906001, I49368001, I49805001, I48032001, I50779001 and I47595001. The thermal inertia was derived using Audouard et al. (2014) method with either OMEGA(a) or TES(b) albedo. Difference in albedo result in difference in thermal inertia (right), and the output is visually better using the highest resolution map.

NETCDF files !

Machine-independant portable format

→ Easy to use with shell, Java, C/Fortran, IDL,Python...

Download the maps !

Using the Planetary Surface Portal PSUP at

http://psup.ias.u-psud.fr/

- **OMEGA-only** map : filled at 94.8 %
- **100 % filled** map (OMEGA + TES) :

→ this QR code :