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The Mars Climate Database (MCD version 5.3)

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Our Global Circulation Model (GCM) simulates the atmospheric environment of Mars. It is developped at LMD (Laboratoire de Meteorologie Dynamique, Paris, France) in close collaboration with several teams in Europe (LATMOS, France, University of Oxford, The Open University, the Instituto de Astrofisica de Andalucia), and with the support of ESA (European Space Agency) and CNES (French Space Agency). GCM outputs are compiled to build a Mars Climate Database, a freely available tool useful for the scientific and engineering communities. The Mars Climate Database (MCD) has over the years been distributed to more than 300 teams around the world. The latest series of reference simulations have been compiled in a new version (v5.3) of the MCD, released in the first half of 2017.

To summarize, MCD v5.3 provides:
- Climatologies over a series of synthetic dust scenarios: standard (climatology) year, cold (ie: low dust), warm (ie: dusty atmosphere) and dust storm, all topped by various cases of Extreme UV solar inputs (low, mean or maximum). These scenarios have been derived from home-made, instrument-derived (TES, THEMIS, MCS, MERs), dust climatology of the last 8 Martian years. The MCD also provides simulation outputs (MY24-31) representative of these actual years.
- Mean values and statistics of main meteorological variables (atmospheric temperature, density, pressure and winds), as well as surface pressure and temperature, CO_2 ice cover, thermal and solar radiative fluxes, dust column opacity and mixing ratio, [H20] vapor and ice columns, concentrations of many species: [CO], [O_2], [O], [N2], [H2], [O_3], ...
- A high resolution mode which combines high resolution (32 pixel/degree) MOLA topography records and Viking Lander 1 pressure records with raw lower resolution GCM results to yield, within the restriction of the procedure, high resolution values of atmospheric variables.
- The possibility to reconstruct realistic conditions by combining the provided climatology with additional large scale and small scale perturbations schemes.

At EGU, we will report on the latest improvements in the Mars Climate Database, with comparisons with available measurements from orbit (e.g.: TES, MCS) and landers (Viking, Phoenix, MSL).