Expert program report: Visit to Aarhus University Planetary Environment Facilities

On 16th of June 2016, a visit to Aarhus University Planetary Environment Facilities was carried out in frame of the Europlanet NA1 Expert Program. The purpose of the visit was to gain hands-on experience of the facility's capabilities and determine its suitability for testing Mars humidity instrumentation provided by European and foreign research an commercial organizations.

The Aarhus facility has the ability to simultaneously control numerous parameters to achieve a Mars like environment inside the chamber. This offers opportunities to measure humidity instruments while being exposed to e.g. dust and wind. This makes validating humidity instruments in the presence of new environmental variables feasible. Such validation can be achieved during the ExoMars/DREAMS science package tests starting on 27th of June 2016.

However, the facility was found to be unfeasible for actual humidity calibration measurements of humidity instruments. This is due to the uncertainties and challenges in controlling the atmospheric temperature and humidity inside the chamber, as well as the difficulty to install a traceable reference humidity instrument into locations of interest inside the chamber.

One humidity instrumentation candidate is provided by the Finnish Meteorological Institute. A preliminary idea of testing FMI's humidity instrument dust protection filter designs in the facility was developed and discussed during the visit. A possible test campaign could place all of the previously developed FMI humidity instrument filter designs inside the chamber to see how they cope with dust deposition. The experience gained by this visit will also benefit other European development of humidity and environmental measurement systems.