

Develop a new satellite-based climate product

Our knowledge of clouds has still large gaps and clouds are recognized as a main uncertainty when trying to assess the climate sensitivity. The uncertainties are especially large when it comes to clouds consisting of ice particles. Not even the mean weight of ice clouds is known, as shown by the figure below (from a recent assessment done by us). The figure shows mean values of “ice water path” (the mass of ice above each 1 m^2) as a function of latitude. The agreement between the different datasets is strikingly poor.

We are participating in the preparations for a new satellite mission, the Ice Cloud Imager (ICI), that should provide better estimates of ice water paths. The idea behind this project is to apply the tools and data we are developing for ICI to derive better estimates of IWP already now. The observations will be taken from the Global Precipitation Mission (GPM), an ongoing satellite mission.

The main tasks of the project are: to understand the retrieval process (how IWP is estimated from the satellite data), perform test retrievals with some different assumptions using existing tools, analyze the results and decide on final set-up, process GPM data for one year and compare to a reference dataset.

Prerequisites: Knowledge and interest in programming and physics.

Contact: Patrick Eriksson, patrick.eriksson@chalmers.se

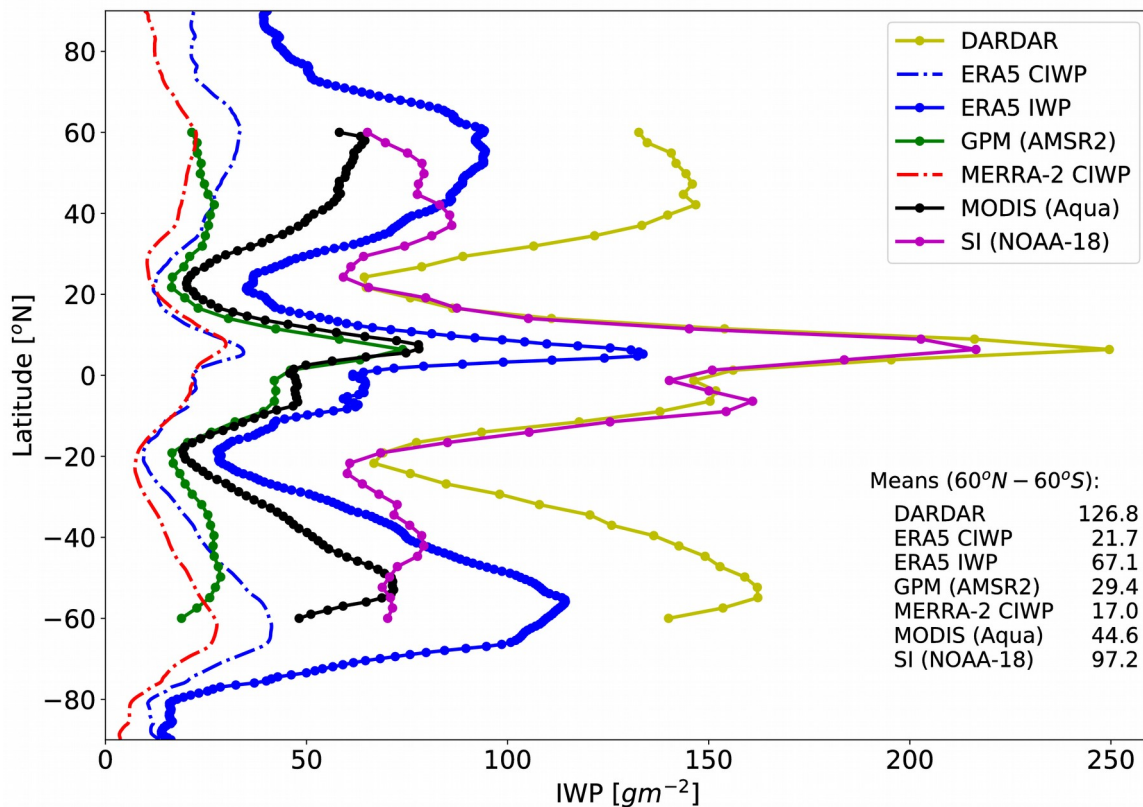


Figure from Duncan and Eriksson, An update on global atmospheric ice estimates from satellite observations and reanalyses, Atmospheric chemistry and physics, 2018.