

Quantifying Aerosol-Cloud-Climate Effects by Regime (QUAERERE)

This request is for the “Quantifying Aerosol-Cloud-Climate Effects by Regime” (QUAERERE) project funded by the European Research Council (ERC) for the period October 2012 – September 2017. This project aims at a reliable quantification of the radiative forcing by anthropogenic aerosols via their ability to serve as cloud condensation and ice nuclei and thus to alter cloud radiative properties. This quantification is to be achieved by an estimate from a statistical analysis of satellite data and a concurrent estimate from a regional climate model. In the regional climate model, model-to-satellite forward operators will be applied, so that the same statistical method applied to the satellite observations can be applied to the virtual “satellite observations” from the regional model. The results from the satellite data and from the regional model will be compared, allowing on the one hand for an evaluation of the model, and allowing on the other hand for detection-and-attribution of the signals found in the data to anthropogenic aerosols. In the final closure, a demonstration that the simulated anthropogenic perturbation of the cloudy-sky radiation balance and the statistically-derived quantification of the aerosol-cloud-climate forcing are consistent will allow for a reliable estimate of the aerosol indirect radiative forcing.