

COMPARISON OF DIFFERENT RETRIEVAL TECHNIQUES

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We discuss and compare different radio occultation retrieval techniques which enables one to obtain information about key atmospheric parameters. Measurements of GPS (Global Positioning System) radio signals by a satellite in a low-Earth orbit (LEO) are used in retrieval processing methods, which is the issue of this poster. The bending of the signal contains information about meteorological atmospheric parameters such as refractivity, temperature, pressure, and water vapour.

The following retrieval methods: the radio holographic method, back propagation, and a new Full Spectrum Inversion (FSI - based on FFT of the whole occultation signal) technique will be compared to a model bending angle profile. The latter is generated from a phantom refractivity profile that is used as input to a wave optics propagator in order to simulate radio occultations. The different retrieval methods are then used on these simulations. The new Full Spectrum Inversion method, developed at DMI, is based on the Stationary Phase Method. The FSI technique is conceptual and computational simple and thus easy to implement and has proven to be capable of disentangle multiple rays in multipath regions in the lower troposphere. Based on a few examples the strengths and weaknesses of the different methods will be discussed.