

## Comparison of the hygroscopic behavior of aerosols obtained by Raman LIDAR and nephelometry – the NASA Discover-AQ experience

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**Abstract:** The hygroscopic behavior of aerosols is of great interest in the recent decades because of the importance in computing the radiative forcing of aerosols in the energy balance of the planet. The last report of the IPCC in 2013 shows that the uncertainty associated to the interactions between aerosols and clouds is high, and more research in this area is needed in order to give more information about the indirect effect of aerosols.

The LIDAR (Light Detections and Ranging) is a technique that can be used to study the hygroscopic growth of aerosols under varying relative humidity conditions, and the main advantage of the technique is the possibility of studying the hygroscopicity next to the saturation in an unperturbed atmosphere.

During the NASA Discover-AQ in 2011, a Raman LIDAR operated at the Howard University in Beltsville, United States, at the same time a nephelometer inside an airplane was sampling the same aerosol population. Then, the hygroscopic growth factor of the aerosols was computed using both instruments, and the results are now being compared.

In this work, the result obtained by the LIDAR will be shown and compared to the nephelometer results obtained by Ziemba et al (2013) for 05 July 2011. The different methodologies adopted are explained and discussed. The good agreement between both instruments shows LIDAR is a promising technique in this field of study.

**Keywords:** hygroscopicity; Lidar; Nephelometer

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