Geophysical Research Abstracts
Vol. 16, EGU2014-14670, 2014
EGU General Assembly 2014

UV Direct Detection Doppler Wind Lidar validation in the frame of ADM/Aeolus mission

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Atmospheric wind profile measurement is a critical variable to improve Numerical Weather Prediction (NWP) models accuracy and for climate studies. The European Space Agency (ESA) Atmospheric Dynamic Mission (ADM) has, as its main goal, to enhance the present meteorological observations system over sparse wind data regions and more importantly to provide direct wind information in the tropics where no geostrophic wind can be derived from mass fields obtained from passive radiometer, by deploying on a satellite a direct detection high spectral resolution 355nm Doppler wind lidar (launch expected in mid-2015). In this study are presented the results and performances of the first ground-based 355nm direct detection Doppler wind lidar prototype against other remote sensors, as lidars, 72 MHz radar and conventional balloon radio soundings during ESA VALID campaign that held at Haute Provence Observatory in July 1999, under all possible different meteorological conditions. The study presents the comparison of different remote sensors using two criteria: Pearson cross-correlation coefficient and root mean square error. The methodology discussed here may be useful in future ESA Aeolus validation campaigns involving different kinds of instruments.