## Concordia Multi-Process Atmospheric Studies (CoMPASs): study of the vertical structure of the Antarctic atmosphere with a synergy of different remote sensing techniques.

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precipitable water vapor (PWV) and the cloud extinction. The latter (bottom panel, left axis) is compared with the downwelling irradiance measured with a broadband infrared radiometer (bottom panel, right axis). The measurement cover the 11/02/2014 in local time (10-11/02/2014 UTC).

AS2.3 | EGU2014-7782

CoMPASs (Concordia Multi-Process Atmospheric Studies) is a project, funded by the Italian Antarctic Program (PNRA), that aims to extend our understanding of the mechanisms underlying the atmospheric system through a multi-process study that exploits the Antarctic region as a specific

The portion of the atmosphere that is studied extends from the planetary boundary layer to the stratosphere. Subject of the analysis will be the micro-meteorological processes in the atmospheric boundary layer, the mechanisms of formation of clouds - and their influence on Earth's radiation budget - and the problems related to the ozone cycle inside of the polar vortex. Particular attention will be paid to feedback mechanisms between the various processes. The French-Italian Concordia station at Dome C is the perfect site to carry out the proposed study, as it is a permanent station on the plateau, within the region of the polar vortex.

The CoMPASs project involves many kinds of remote sensing instruments operating from the ground: • Two elastic polarization diversity lidars, with complementary ranges (0-10 km and 7-30 km), providing the profiles of the optical

- properties of the atmosphere from the boundary layer to the stratosphere.
- downwelling thermal emission of the atmosphere.

• A surface-layer mini sodar (SLM) with high vertical resolution, supported by in-situ sensors, for the monitoring of the structure and height of the atmospheric boundary layer and of its variability in presence of clouds and mist.

atmospheric opacity.

main buildings.



The Physics shelter at Concordia station, where the two LIDARs and the REFIR-PAD infrared spectroradiometer are installed





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• A spectroradiometer (REFIR-PAD) operating in the middle-far infrared to measure, in the 100-1600 cm<sup>-1</sup> spectral range, the



## EGU General Assembly 2014 - Vienna | Austria | 27 April-3 May 2013





