



Atmospheric and precipitation sounding with polarimetric radio-occultations aboard PAZ LEO

Ramon Padulles (1), Estel Cardellach (1), Sergio Tomás (1), Santi Oliveras (1), Antonio Rius (1), Manuel de la Torre (2), Joseph Turk (2), Chi Ao (2), Robert Kursinski (3), Bill Shreiner (4), Dave Ector (4), Lidia Cucurull (5), and Jens Wickert (6)

(1) Instituto de Ciencias del Espacio-CSIC, Bellaterra (Barcelona), Spain (padulles@ice.cat), (2) NASA/Jet Propulsion Laboratory, Pasadena, CA, USA, (3) Moog Broad Reach CO, USA, (4) University Corporation for Atmospheric Research, Boulder, CO, USA, (5) National Oceanic and Atmospheric Administration, Boulder, CO, USA, (6) GFZ, Postdam, Germany

The Radio Occultation and Heavy Precipitation experiment aboard the PAZ Low Earth Orbiter (ROHP-PAZ) is a mission of opportunity: The Spanish Ministry of Science and Innovation (MICINN) approved in 2009 a proposal to include a polarimetric Global Navigation Satellite System (GNSS) Radio-Occultation (RO) payload on board of the Spanish Earth Observation satellite PAZ. This will be a new technique that has never been tested before, that aims to improve the knowledge of the precipitation through simultaneous thermodynamic and vertical rain profiles.

The concept is similar to that used in some polarimetric weather radars: to measure the differential phase shift between the two polarimetric antennas, although here we will use the forward scattering geometry instead of the backscattering. The depolarization effect increases as the propagation line aligns with the plane of the drops' flattening (nominally perpendicular to the local gravity, i.e. parallel to the local horizon). The RO signals cross the lower troposphere tangentially, i.e. along the local horizon, which should maximize the depolarization effect.

The satellite launch is scheduled for March 2015, and it will be followed by a 6-month commissioning phase period and has an expected life of 7 years, with a goal of 10 years.

A sensitivity analysis have been performed, showing that we should be able to detect the 90\% of all the events with along-ray averaged rain rate higher than 5 mm/h. Also, a ground field campaign has been conducted prior to the launch of the satellite. Results from the campaign also show a good correlation between phase shifts increases and heavy rain events.

We will present here the status of the mission, which will have been launched few weeks before the EGU, together with some preliminary data analysis from both the actual satellite data and the prior-to-launch work.