

TO Brownbag Seminar
May 8, 2012

Pascal Willis
Institut de Physique du Globe de Paris

New Applications of the DORIS System for Geodynamics and Earth Sciences

Initially developed by CNES (French Space Agency) for Precise Orbit Determination of satellite altimeter missions such as TOPEX/Poseidon and the Jason series, the DORIS system now includes about 60 permanent ground tracking stations evenly distributed around the globe. Since the first satellite (SPOT-2) in 1990, the DORIS technology has gradually evolves and currently equips about a dozen of Low Earth Orbiting satellites (Cryosat-2, Chinese HY-2A,..), now allowing geodetic performances at 10 mm or better (in 3-D) and around 1 mm/year or better or ground stations velocities.

We will first describe the specificities of the DORIS system with regards to the widely used GPS system and provide historical background of its development. We will then present current geodetic performances and their possible use in geodynamics studies (tectonics, local or regional deformation), in conjunction with other source of data, by providing a few key examples. In particular, a new tool on the International DORIS Service (IDS) Web site now allows an easy download of regular DORIS results since 1993 (<http://ids-doris.org/plot-tools.html>). Finally, we will also demonstrate how new DORIS products (Zenith Total Delays and horizontal tropospheric gradients) could be used for climatological studies. Due to its rather dense tracking network (about 60 stations), its homogeneous geographical distribution, the stability of its ground equipment (only 2 types of antennas exist) and the long-term time series of observations (since 1993), DORIS results can provide valuable data for tectonics and climatology.