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# Implementation of ITRF2014 for Doris orbit determination of CryoSat-2

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In this paper we discuss our efforts to perform precision orbit determination (POD) of CryoSat-2 which depends on Doppler and satellite laser ranging tracking data. A dynamic orbit model is set-up and the residuals between the model and the tracking data is evaluated. The average r.m.s. of the 10 second averaged Doppler tracking pass residuals is approximately 0.39 mm/s; and the average of the laser tracking pass residuals becomes 1.42 cm. We discuss three improvements that have brought the orbit accuracy to this level, it concerns the way we implement temporal gravity accelerations observed by GRACE; the implementation of ITRF2014 coordinates and velocities for the DORIS beacons and the SLR tracking sites. We also discuss an adjustment of the SLR retroreflector position within the satellite reference frame. An unexpected result is that we find a systematic difference between the median of the 10s Doppler tracking residuals which displays a statistically significant pattern in the South Atlantic Anomaly area where the median of the velocity residuals varies in the range of -0.15 to +0.15 mm/s.