

## Noise evolution in IDS contributions: from ITRF2014 to ITRF2020

*Janusz Bogusz (Military University of Technology), Anna Klos (Military University of Technology) and Guilhem Moreaux (Collecte Localisation Satellites)*

**Abstract.** We examine DORIS (Doppler Orbitography and Radiopositioning Integrated by Satellite) position time series processed by the IDS (International DORIS Service) within “ids21wd02” reprocessing, serving as an official input into the newest International Terrestrial Reference Frame, namely ITRF2020 as well as “idswd09” series aligned to ITRF2014. The North, East and Up coordinate time series are carefully pre-processed by means of removing outliers and offsets with the use of IDS database supported by manual inspection. To reliably describe the DORIS position time series, we use a time series model of long-term non-linear signal, linear trend, seasonal oscillations and a stochastic part. Both deterministic and stochastic components are determined using Maximum Likelihood Estimation (MLE). Firstly, we search for a preferred noise model and then demonstrate, that there is an ongoing improvements of noise parameters over years in station-to-station comparison. They may be caused by implementation of new mean pole and HF tidal EOP model as recommended by IERS, the use of quaternions for the attitude of the Jason and Cryosat-2 satellites, addition of the new missions: Jason-3 and Sentinel-3A/B, the use of a new Alcatel phase center model, an implementation of Jason-2 SAA mitigation strategies or new data editing.