

JASON 2 DORIS MEASUREMENTS

Flavien Mercier¹, Luca Cerri¹, Sabine Houry¹
¹*CNES Toulouse France*

Abstract

The Doris instrument on Jason 2 has many important differences relatively to the preceding generation like the one of Jason 1. Together with these new capabilities, the reference measurements format has been changed. Now, the measurement observables are very similar to the GPS, and a Rinex 3 format has been extended to take into account Doris characteristics. These measurement files are available at IDS.

We begin with a brief overview of the new observable definitions. The Doris measurements are now expressed in terms of phase and pseudo-range, which are corrected by the ground segment in order to be synchronous. This simplifies a lot the processing.

The corresponding properties are detailed, and the processing used in the Zoom POD software will be presented (construction of equivalent iono-free Doppler measurements, preprocessing, use of the pseudo-range observable for measurement epoch estimation).

An important difference with the preceding versions of Doris, is that the instrument has now six channels, and a seventh one with a specific parameterization. This important number of channels means that a lot of new measurements are now performed. However, an important part of these measurements has very low elevations relatively to the ground antennas and correspond to very important tropospheric effects. This is interesting for troposphere studies and station positioning, but may also degrade the orbit determination due to the limited performance of current troposphere models. This explains why an important part of the measurements is currently edited in the POD calculations, even if these measurements are correct.

An other important feature is the direct availability of the phase count from the beginning of a pass. A study has been performed on the apparition of the 2 GHz cycle slips, which are concentrated on the low elevation passes, close to the maximum elevation (near the zero Doppler measurements). It is shown that it is possible to reconstruct almost all these cycle slips.