Validation Activities for Jason-1 and TOPEX/Poseidon Precise Orbits

OVERVIEW

We have developed a short-arc orbit technique (Bonnefond et al., 2000) based on the GDR orbit products (LAI, 2000) and the standard deviation of SLR residuals for Jason-1 (over 2002) and TOPEX/Poseidon (over 1993). We believe that this test is a good representative of the orbit error for the Jason-1 mission. It is possible to use this test to evaluate with a given confidence the standard deviation of the precise orbit error over a given time period. The short-arc orbit technique provides an accurate assessment of the SLR residuals (standard deviation of SLR residuals over 2002 for Jason-1 and over 1993 for TOPEX/Poseidon) and allows the estimation of the orbit error (standard deviation of SLR residuals over 2002 for Jason-1 and over 1993 for TOPEX/Poseidon) and the variation of the orbit error over the given time period.

SATELLITE LASER RANGING DATA BIASES: CONSEQUENCES ON TERRESTRIAL REFERENCE FRAME

The comparison between SLR and GPS network is usually conducted using a precise orbit and the reference frame of the SLR network is often used to estimate the orbit error from the SLR measurements. For the Jason-1 mission we choose the ITRF 2000 as reference frame for the SLR data. However, the SLR network is also used to estimate the orbit error from the SLR measurements using the ITRF 2000 as reference frame. Therefore, we must consider the impact of the reference frame on the orbit error estimation.

IMPACT FOR ALTIMETER CALIBRATION

Jason-1

Some experiments have been performed for Jason-1 with the aim of improving the orbit error estimation. These experiments have been performed using the Jason-1 GDR orbit products and the ITRF 2000 as reference frame. The results of these experiments have been used to improve the orbit error estimation for Jason-1.

TOPEX/Poseidon

The TOPEX/Poseidon GDR orbit products have been used in the orbit error estimation. These experiments have been performed using the TOPEX/Poseidon GDR orbit products and the ITRF 2000 as reference frame. The results of these experiments have been used to improve the orbit error estimation for TOPEX/Poseidon.

IMPACT OF TERRESTRIAL REFERENCE FRAME ON TOPEXPOSEIDON AND JASON-1 ORBITS

The results of these experiments have been used to improve the orbit error estimation for TOPEX/Poseidon and Jason-1. The results of these experiments have been used to improve the orbit error estimation for TOPEX/Poseidon and Jason-1. The results of these experiments have been used to improve the orbit error estimation for TOPEX/Poseidon and Jason-1. The results of these experiments have been used to improve the orbit error estimation for TOPEX/Poseidon and Jason-1. The results of these experiments have been used to improve the orbit error estimation for TOPEX/Poseidon and Jason-1.

Plate 1 shows the radially-difference between the new NASA-Poseidon TVG GDR orbits and the old (GDR) orbits. The second value respectively corresponds to the estimated orbit error for Jason-1 and TOPEX/Poseidon. The plate 1 shows the radially-difference between the new NASA-Poseidon TVG GDR orbits and the old (GDR) orbits. The second value respectively corresponds to the estimated orbit error for Jason-1 and TOPEX/Poseidon. The plate 1 shows the radially-difference between the new NASA-Poseidon TVG GDR orbits and the old (GDR) orbits. The second value respectively corresponds to the estimated orbit error for Jason-1 and TOPEX/Poseidon. The plate 1 shows the radially-difference between the new NASA-Poseidon TVG GDR orbits and the old (GDR) orbits. The second value respectively corresponds to the estimated orbit error for Jason-1 and TOPEX/Poseidon.