Comparison of S-Band PTR time delay between CCI IF and IPF

Study variable	**PTR_DELAY_CCI_IF**
Reference variable	**PTR_DELAY_IPF**
Missions	Envisat *(en)*
Period	[19265.898824964341, 20525.898821645231]

Creation date : 2011/09/06

Contents

Study overview

In this study, the new PTR time delay with IF mask developed in the frame of sea-level CCI project has been compared to the IPF PTR time delay used in the current ground segment to improve the ENVISAT sea surface height (SSH) in S-Band.

The impact of using these two PTR time delay on the SSH calculation has been analyzed for ENVISAT mission from October 2002 (cycle 10) to July 2010 (Cycle 90).

The PTR time delay is an instrumental correction computed in level 1b of ENVISAT ground segment. This correction allows, among other things, to take into account the ageing of the altimeter. The CCI PTR time delay is a update of the IPF one in order to account for the IF mask and improve the resolution. Both PTR time delay were provided by IsardSAT which is in charge of the ENVISAT Level 1b.

All the validation diagnostics displayed in this report have been performed in agreement with the Sea-Level CCI Product Validation Plan (PVP).
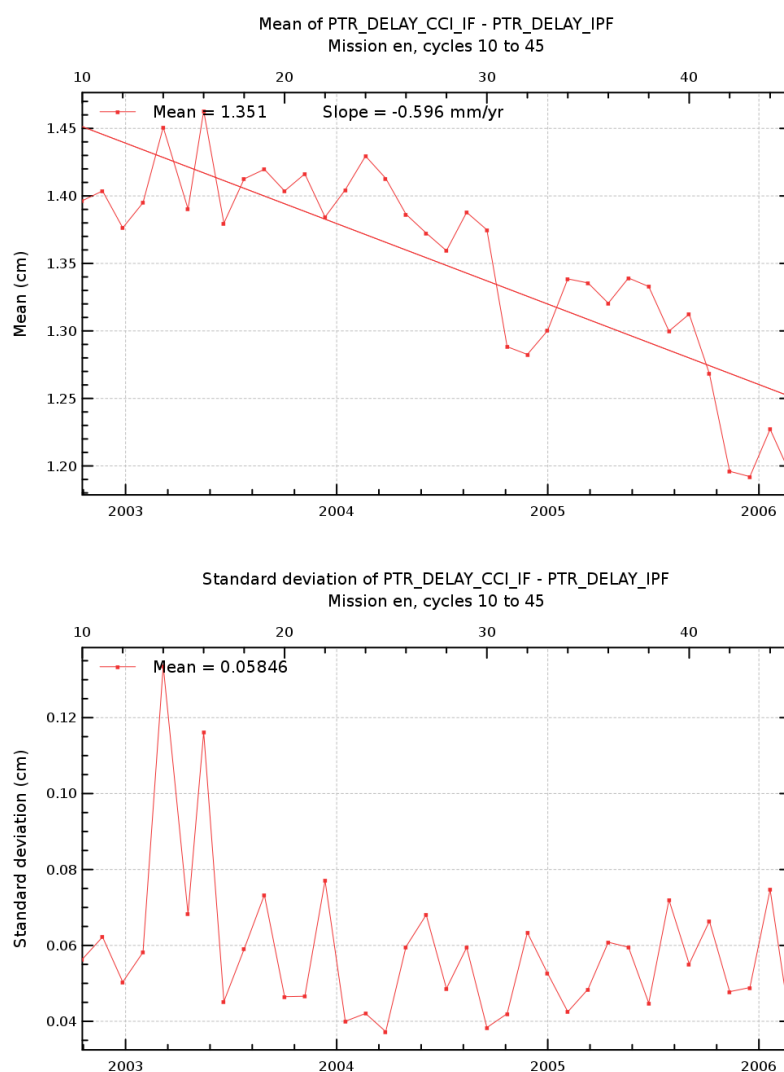
Diagnostic A001 (mission en)

Name : Temporal evolution of differences between both altimetric components

Input data : Along-track altimetric components

Description : The temporal evolution of global statistics (mean, variance, slope) of differences between 2 different standards of a same altimetric component (sea surface height correction, altimeter parameter, orbit) are calculated from a cyclic way (altimeter repetivity, daily, weekly, monthly) . These statistics are calculated from 1 Hz altimetric measurements after removing spurious sea level measurements.

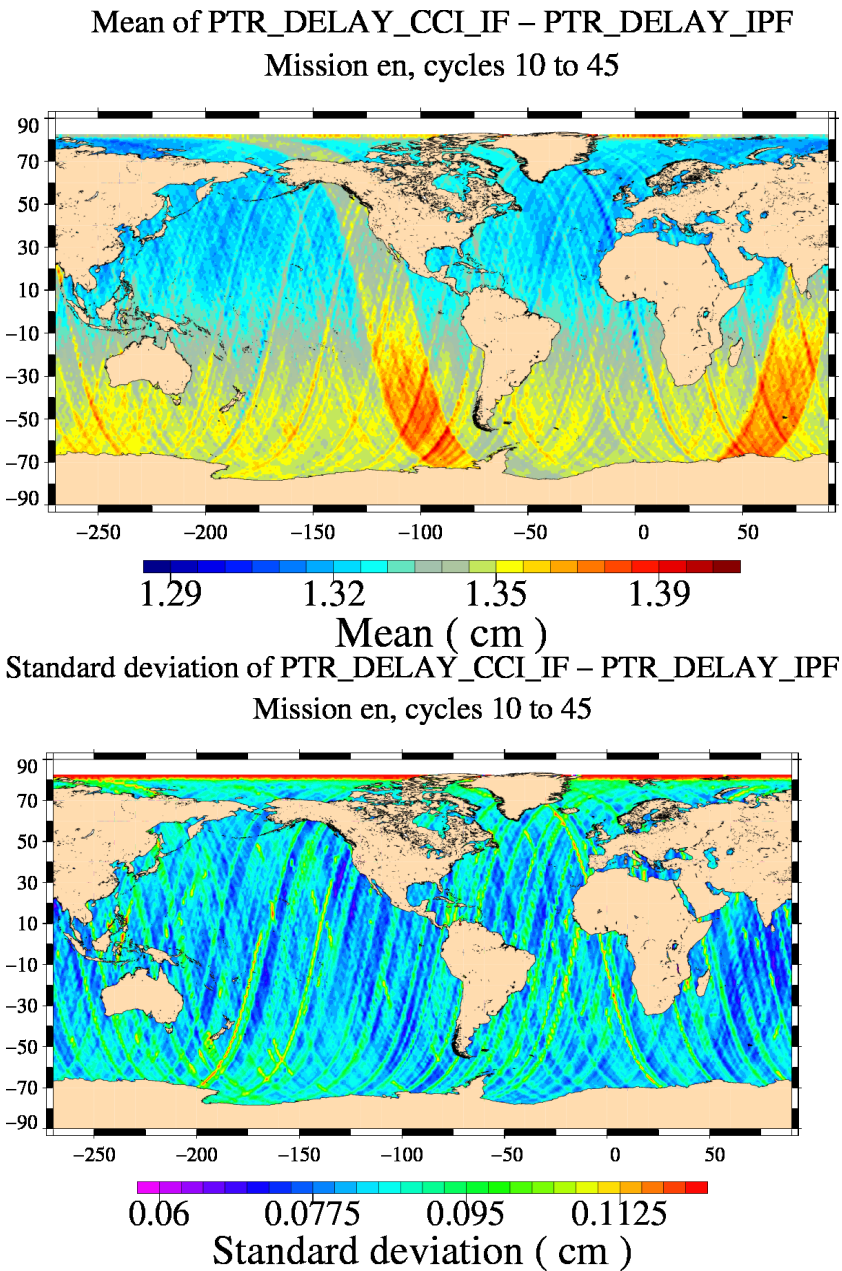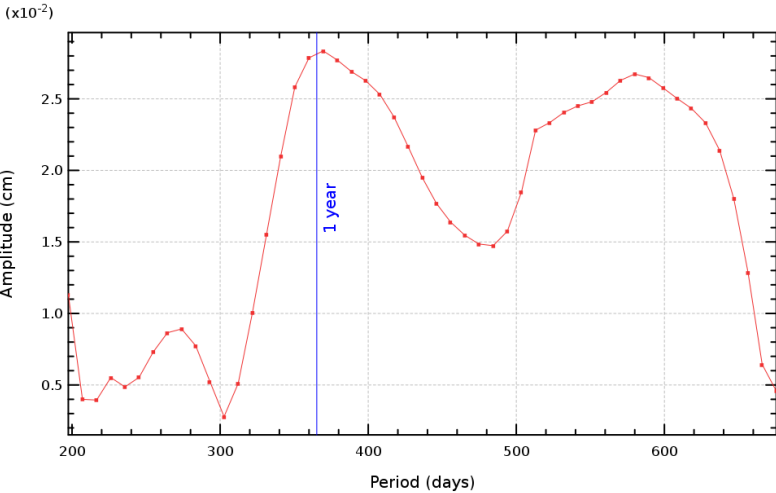**Diagnostic type :** Global internal analyses

Mean of PTR_DELAY_CCI_IF - PTR_DELAY_IPF
Mission en, cycles 10 to 45
Mean = 1.351   Slope = -0.596 mm/yr

Standard deviation of PTR_DELAY_CCI_IF - PTR_DELAY_IPF
Mission en, cycles 10 to 45
Mean = 0.05846

Diagnostic A002 (mission en)

Name : Map of differences between both altimetric components over all the period

Input data : Along-track altimetric components

Description : The map of global statistics (mean, standard deviation) of differences between 2 different standards of a same altimetric component (sea surface height correction, altimeter parameter, orbit) are calculated over a given period which is the longer as possible to have obtain reliable statically results. These statistics are calculated from 1 Hz altimetric measurements after removing spurious sea level measurements.
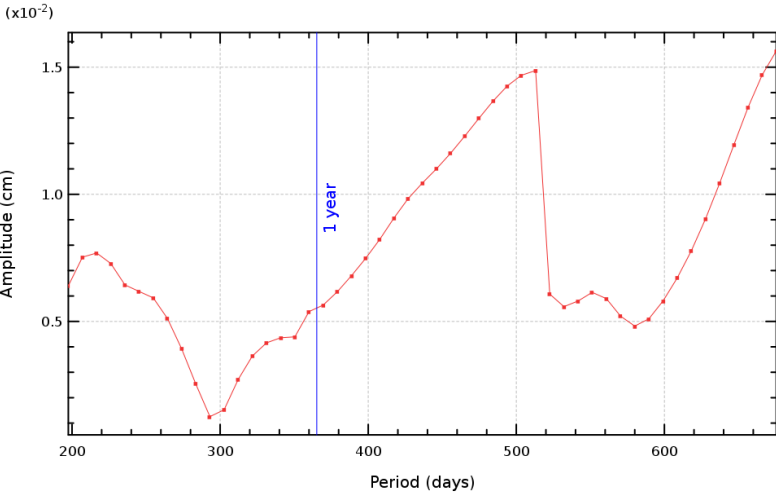
Diagnostic type : Global internal analyses

Mean of PTR_DELAY_CCI_IF − PTR_DELAY_IPF
Mission en, cycles 10 to 45

Mean (cm)

Standard deviation of PTR_DELAY_CCI_IF − PTR_DELAY_IPF
Mission en, cycles 10 to 45

Standard deviation (cm)

Diagnostic A003_a (mission en)

Name : Periodogram derived from temporal evolution of altimetric component differences

Input data : Along-track altimetric components

Description : The periodogram derived from temporal and global altimetric component differences is calculated from cycle by cycle monitoring of altimetric component differences (derived from diagnostic A001). It is calculated from the mean or the variance differences. The Periodogram can be calculated for all the periods, but it can be focused on a dedicated period.

Diagnostic type : Global internal analyses

Periodogram of the mean of PTR_DELAY_CCI_IF - PTR_DELAY_IPF (reference period = 1 year)
Mission en, cycles 10 to 45

Periodogram of the standard deviation of PTR_DELAY_CCI_IF - PTR_DELAY_IPF (reference period = 1 ye
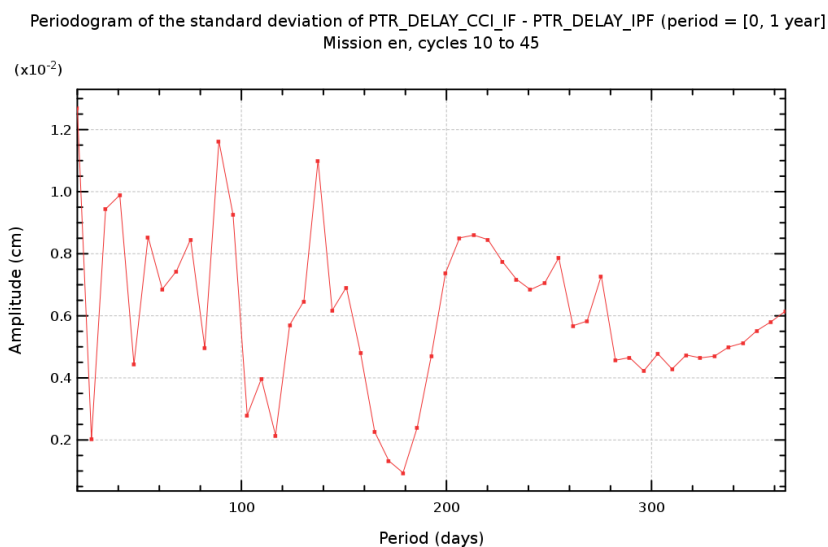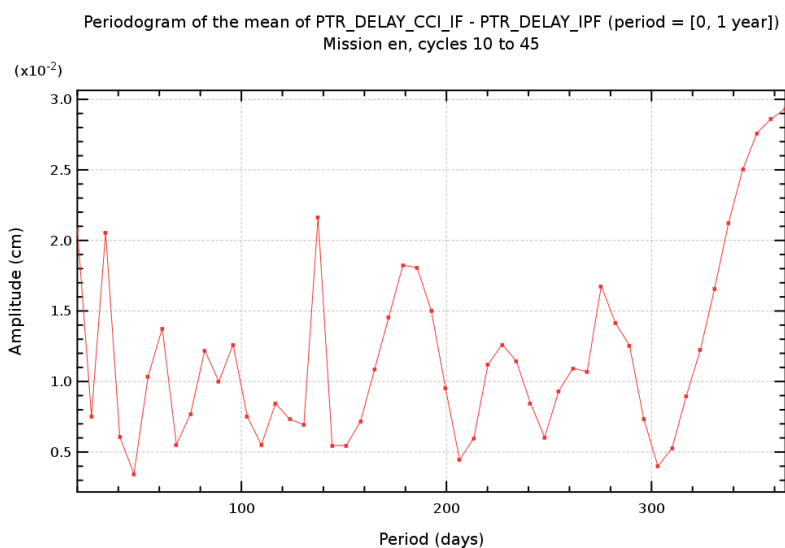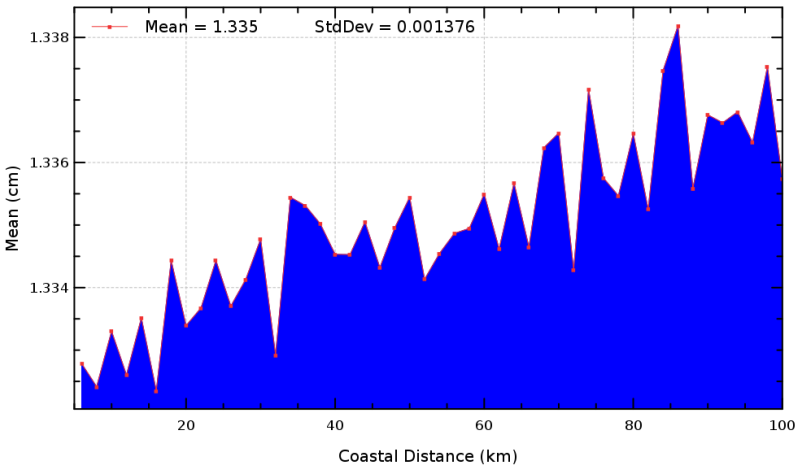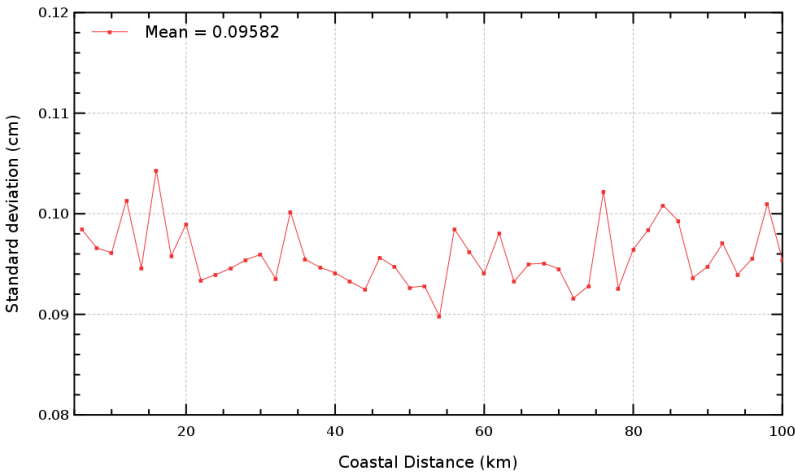Mission en, cycles 10 to 45

Diagnostic A003_b (mission en)

Name : Periodogram derived from temporal evolution of altimetric component differences

Input data : Along-track altimetric components

Description : The periodogram derived from temporal and global altimetric component differences is calculated from cycle by cycle monitoring of altimetric component differences (derived from diagnostic A001). It is calculated from the mean or the variance differences. The Periodogram can be calculated for all the periods, but it can be focused on a dedicated period.

Diagnostic type : Global internal analyses

Periodogram of the mean of PTR_DELAY_CCI_IF - PTR_DELAY_IPF (period = [0, 1 year])
Mission en, cycles 10 to 45

Periodogram of the standard deviation of PTR_DELAY_CCI_IF - PTR_DELAY_IPF (period = [0, 1 year]
Mission en, cycles 10 to 45

Diagnostic A004 (mission en)

Name : Altimetric component differences versus coastal distances

Input data : Along-track altimetric components

Description : Mean and standard deviation of the differences between 2 different standards of a same altimetric component (sea surface height correction, altimeter parameter, orbit) are computed and plotted in function of coastal distances between 0 and 100 km.

Diagnostic type : Global internal analyses

Mean of PTR_DELAY_CCI_IF - PTR_DELAY_IPF
Mission en, cycles 10 to 45

Mean = 1.335   StdDev = 0.001376

Standard deviation of PTR_DELAY_CCI_IF - PTR_DELAY_IPF
Mission en, cycles 10 to 45

Mean = 0.09582