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CryoSat SIRAL Calibration and Performance

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The main payload of CryoSat is a Ku band pulse-width limited radar altimeter, called SIRAL (Synthetic interferometric radar altimeter), that transmits pulses at a high pulse repetition frequency thus making the received echoes phase coherent and suitable for azimuth processing.
This allows to reach an along track resolution of about 250 meters which is a significant improvement over traditional pulse-width limited altimeters.
Due to the fact that SIRAL is a phase coherent pulse-width limited radar altimeter, a proper calibration approach has been developed, including both an internal and external calibration.
The internal calibration monitors the instrument impulse response and the transfer function, like traditional altimeters. In addition to that, the interferometer requires a special calibration developed ad hoc for SIRAL.
The external calibration is performed with the use of a ground transponder, located in Svalbard, which receives SIRAL signal and sends the echo back to the satellite.
Internal calibration data are processed on ground by the CryoSat Instrument Processing Facility (IPF1) and then applied to the science data. By April 2013, almost 3 years of calibration data will be available, which will be shown in this poster.
The external calibration (transponder) data are processed and analyzed independently from the operational chain. The use of an external transponder has been very useful to determine instrument performance and for the tuning of the on-ground processor. This poster presents the transponder results in terms of range noise and datation error.