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CryoSat Level1b SAR/SARin BaselineC: Product Format and Algorithm Improvements

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CryoSat was launched on the 8th April 2010 and is the first European ice mission dedicated to the monitoring of precise changes in the thickness of polar ice sheets and floating sea ice. Cryosat carries an innovative radar altimeter called the Synthetic Aperture Interferometric Altimeter (SIRAL), 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 a significantly improved along track resolution with respect to traditional pulse-width limited altimeters.
CryoSat is the first altimetry mission operating in SAR mode and continuous improvements in the Level1 Instrument Processing Facility (IPF1) are being identified, tested and validated in order to improve the quality of the Level1b products.
The current IPF, Baseline B, was released in operation in February 2012. A reprocessing campaign followed, in order to reprocess the data since July 2010. After more than 2 years of development, the release in operations of Baseline C is expected in the first half of 2015.
BaselineC Level1b products will be distributed in an updated format, including for example the attitude information (roll, pitch and yaw) and, for SAR/SARIN, the waveform length doubled with respect to Baseline B.
Moreveor, various algorithm improvements have been identified:
• a datation bias of about -0.5195 ms will be corrected (SAR/SARIn)
• a range bias of about 0.6730 m will be corrected (SAR/SARIn)
• a roll bias of 0.1062 deg and a pitch bias of 0.0520 deg
• Surface sample stack weighting to filter out the single look echoes acquired at highest look angle, that results in a sharpening of the 20Hz waveforms

With the operational release of BaselineC, the second CryoSat reprocessing campaign will be initiated, taking benefit of the upgrade implemented in the IPF1 processing chain but also at IPF2 level. The reprocessing campaign will cover the full Cryosat mission starting on 16th July 2010.

This poster details the new information that will be added in the CryoSat BaselineC Level1b SAR/SARin products and the main quality improvements will be described.