



CRUCIAL: Cryosat-2 Success over Inland Water and Land: SAR and SARin Full Bit Rate Altimetric Heights and Validation

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CRUCIAL is an ESA/STSE funded project investigating innovative land and inland water applications from Cryosat-2 with a forward-look component to the future Sentinel-3 and Jason-CS/Sentinel-6 missions. The high along-track sampling and resolution of Cryosat-2 altimeter in SAR and SARin modes offer the opportunity to recover high frequency signals over inland waters. This paper will present the theoretical approach to analysis of the FBR L1A Doppler beams to form a product using ground cell gridding, beam steering and beam stacking from which inland water heights are derivable from the retracked Cryosat-2 altimetric waveforms. Details of the processing strategy will include a comparison of waveforms and heights from the burst echoes (~ 80 m along-track) and from multi-look waveforms (~ 320 m along-track). SAR and SARin FBR data are available for the Amazon, Brahmaputra and Mekong. The Mekong and Amazon FBR SAR data has been processed for 2011-2015 and results will be compared against stage data from the nearest gauge. Similarly, heights from Tonle Sap will be compared against Jason-2 data from the United States Department of Agriculture web site. A strategy to select the number of multi-looks over rivers will also be presented. Results of FBR SARin processing will be presented including comparison of heights from the two antennae and the extraction of slope of the ground surface.