CRUCIAL: Cryosat-2 Success over Inland Water and Land: Preliminary Inland Water 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 mission. The fact that the Earth’s land surface is, in general, a relatively poor reflector of Ku band energy, with the exceptions of inland water, salar and ice surfaces has enabled Earth-orbiting satellite radar altimeters to be used for land surface applications including mapping and measurement of river and lake systems. The high along-track sampling of Cryosat-2 altimeter in SAR mode (I8 KHz) offers the opportunity to recover high frequency signals over much of the Earth’s land surface, enhancing the inland water height retrieval capability. Constraining this application is the limited availability of SAR Full Bit Rate (FBR) data from Cryosat-2 over these land surfaces; however, for Sentinel-3 the SAR mode will be deployed widely over land. This paper will summarise the CRUCIAL aims and objectives and present preliminary inland water heights from retracked Cryosat-2 altimetric waveforms, including results over Lake Malawi, the Amazon, Mekong and Brahmaputra with validation against in situ and other satellite data where possible.