



## **ENVISAT Radar Altimeter Individual Echoes and S-Band Investigations**

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A unique feature of the ENVISAT RA-2 is to provide bursts of individual, unaveraged Ku band echo sample data in phase (I) and quadrature (Q), at the full rate 1800 Hz. This data offers a unique possibility to assess the full capabilities of altimeter measurements. Both technically and scientifically, much can be expected from these bursts of individual echoes, e.g., speckle characteristics over different altimeter scenes, ocean, ice, land, but also, potential blurring effects associated with range window changes during the 100 echoes on-board averaging. Moreover, for the first time in altimetry from space, investigations can be carried on the direct use of phase information from backscatter signals. ENVISAT RA-2 also features a second frequency in S band. The combination between absolutely calibrated Ku and S band data can yield interesting improvement for wind speed, wave period, gas exchange estimates, etc. ESA has launched a study on this topic to seed the use of individual echoes by scientists. This study is nearing completion and reconstructed echoes will be made available for the first time to the scientific community. Near final results from the technical and scientific application of individual echoes and S band data will be presented.