

High resolution wind and current fields from Synthetic Aperture Radar measurements

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It is now gradually demonstrated that careful analyses of the median Doppler shift in radar echoes recorded by ENVISAT's Advanced Synthetic Aperture Radar consistently reveal a clear and stable signature. This signature, in turn, appears to allow for quantitative interpretation in the context of surface wind and surface currents. However, to invert this signature to exact contribution from the two fields is challenging and not necessarily unambiguous. Recently, progresses have also been made concerning a radar imaging model (RIM) of ocean surface features such as fronts and eddies. The RIM builds on the composite model approach to account for Bragg, specular reflections, and impact of wave breaking scattering mechanisms. Combining these two approaches the previously unnoticed Doppler signal can thus be merged with traditional information on surface roughness to provide unambiguous very high resolution wind and current fields. In this presentation we will show examples of this development and discuss the robustness of the approach.