



Application of Envisat RA-2 measurements over land surfaces: the case of Mozambique flood

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Radar altimetry measurements have been traditionally used to monitor ocean surfaces and ice caps. Previous studies have shown the potentialities of radar altimetry to monitor land surfaces at the global scale. However, radar altimetry applications over continental surfaces remain relatively underdeveloped.

The aim of this study is to use Envisat RA-2 data to detect water puddles of very reduced dimensions (about 1 meter wide) where typically malaria mosquitoes reproduce. Different teams have already carried out studies in order to exploit the use of Earth Observation (EO) data with epidemiology purposes. Nowadays it has been demonstrated that there is no instrument that could detect such small patches of water unless there are many of them spread in an area of several hundreds of meters.

The interest of RA-2 relies on its ability to discriminate a particular echo shape. Due to the flatness of these water surfaces (and therefore very specular reflection), these areas will produce a particular echo shape even if the water surface is only a small part of the radar footprint. Despite RA-2 spatial resolution (about 350m) being rather poor when compared to other radar systems like ASAR (20m), its ability to discriminate a particular echo shape can allow to detect water surfaces much smaller than the RA-2 spatial resolution.

In this study, five-year-measurements of the Envisat radar altimeter are studied over Mozambique. The temporal and spatial stability of the parameters from the different nominal retracking procedures is assessed. Our results show, among other, the capabilities of radar altimeter to map flooded areas. These results are very promising and they open ground for new applications.