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Author: Mrs. Faviola Romero
Thales Alenia Space, France, faviola.romero@thalesaleniaspace.com

SPACE-BASED ALTIMETRY: THE PATH TO DATE AND FUTURE PROSPECTS

Abstract

The paper discusses the evolution of space based altimetry instruments for earth observation, the current applications of the data obtained and the future perspectives in this field. A theoretical framework is presented to understand the general principle of radar altimeters and the mission characteristics. Subsequently, a technical comparison between the altimeters already in orbit – and those who will soon be launched – is presented. The different technologies are hereby epitomized: Nadir low resolution, Nadir SAR, Nadir SAR Interferometry, Swath and Rotating image. The following section discusses the key role of the data provided by altimeters in fields such as oceanography, climate change and topography. New methods and applications of altimetry data exploitation are proposed and correlated along with potential technologies which can improve the performance of the instrument. It is hoped that this study will contribute to the democratization of space altimetry science in benefit of the human kind.