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Satellite Altimetry for the monitoring of water level in lakes and Rivers: overview and perspectives

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We present an overview of the monitoring of water levels by satellite altimetry, the past missions and data and the near future perspective with the turn from research missions to operational missions.
Since the early 90's, altimeters onboard satellites orbiting around the Earth collect radar measurements over continental water bodies. Now, after 2 decades of R&D, the processing of these measurements is mature enough for time series of water level be computed, at the level of accuracy of a few cm over lakes to a few decimeters over rivers. Today, these measurements are collected only for the water bodies crossed by the orbit ground track. In a few years, with the launch of wide swath missions such as SWOT (a NASA/CNES mission to be launched in 2021), all the water bodies larger than 250mx250m will be monitored with an accuracy of a few centimeters.
These data, distributed for free all over the world, with a spatial sampling that exceeds the needs and a poor temporal sampling dictated by the orbit geometry will be a perfect complement of the national in-situ networks.
In this presentation, we will recall the major steps in R&D that led to the current quality of the water level products, the way the data are distributed via websites and the perspective offered by the Copernicus program which guaranty the continutity of service for operational applications