Basic Radar Altimetry Toolbox: tools and tutorial to use radar altimetry for cryosphere

Vinca Rosmorduc (1), Jerome Benveniste (2), Emilie Bronner (3), Sander Niemeijer (4), Salvatore Dinardo (5), Bruno Manuel Lucas (6), and Didier Earith (7)

(1) CLS, Aviso, Ramonville StAgne, France (vinca.rosmorduc@cls.fr), (2) European Space Agency, Frascati, Italy, (3) CNES, Toulouse, France, (4) Science & Technology, Delft, Netherlands, (5) SERCO/ESRIN, Frascati, Italy, (6) DEIMOS/ESRIN, Frascati, Italy, (7) AKKA, Toulouse, France

Radar altimetry is very much a technique expanding its applications. If quite a lot of efforts have been made for oceanography users (including easy-to-use data), the use of those data for cryosphere application, especially with the new ESA CryoSat-2 mission data is still somehow tedious, especially for new altimetry data product users. ESA and CNES thus had the Basic Radar Altimetry Toolbox developed a few years ago, and are improving and upgrading it to fit new missions and the growing number of altimetry uses.

The Basic Radar Altimetry Toolbox is an "all-altimeter" collection of tools, tutorials and documents designed to facilitate the use of radar altimetry data. The software is able:
- to read most distributed radar altimetry data, from ERS-1 & 2, Topex/Poseidon, Geosat Follow-on, Jason-1, Envisat, Jason- 2, CryoSat and the future Saral missions,
- to perform some processing, data editing and statistic,
- and to visualize the results.
It can be used at several levels/several ways:
- as a data reading tool, with APIs for C, Fortran, Matlab and IDL
- as processing/extraction routines, through the on-line command mode
- as an educational and a quick-look tool, with the graphical user interface

As part of the Toolbox, a Radar Altimetry Tutorial gives general information about altimetry, the technique involved and its applications, as well as an overview of past, present and future missions, including information on how to access data and additional software and documentation. It also presents a series of data use cases, covering all uses of altimetry over ocean, cryosphere and land, showing the basic methods for some of the most frequent manners of using altimetry data. It is an opportunity to teach remote sensing with practical training.
It has been available from April 2007, and had been demonstrated during training courses and scientific meetings. About 1500 people downloaded it (end of 2010), with many "newcomers" to altimetry among them, including teachers and professors. Users' feedback, developments in altimetry, and practice, showed that new interesting features could be added. Some have been added and/or improved in version 2 and 3. Others are under development, some are in discussion for the future.

Data use cases on cryosphere applications will be presented.

BRAT is developed under contract with ESA and CNES. It is available at http://www.altimetry.info and http://earth.esa.int/brat/