BRAT and GUT toolboxes

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• Project started in 2005 from the combined efforts of ESA and CNES.
• Objective of creating a collection of tools and tutorials, useful to novices as well as experts, to facilitate the processing of radar altimetry data.
• Goals met with the creation of the toolbox BRAT and the companion tutorial RAT (Radar Altimetry Tutorial @ http://altimetry.info/).
• BRAT enables you to read, manipulate and plot altimetry data from ERS-1 (1991) to Sentinel-3 (2016). Any NetCDF can be ingested and the IO layer is easily expandable through XML.
• Since BRAT 4.1.0 (April 2017), it’s possible to have access to the Radar Altimeter Database System (RADS) from within BRAT: altimeter data since 1985 directly at your fingertips.
BRAT (Broadview Radar Altimetry Toolbox)

- **BRAT** is mostly focused on the application of altimetry for **Oceanography** and **Hydrology**. As such, BRAT already comes with **pre-built formulas** for those fields.
- Nonetheless, users can **create their own formulas** using **simple operators** or even **Python**, from within **BRAT**.
- Also, BRAT can be **used with MATLAB/IDL** (through reading functions) or **C/C++/Python/Fortran** (via programming APIs).
- **BRAT 4.2.0** to be release in **October**.
• While **BRAT** provides users the **capabilities**, the tutorial **RAT** (Radar Altimetry Tutorial @ [http://altimetry.info/](http://altimetry.info/)) provides them the **knowledge**.

• Users can find **uses cases** with **practical examples** of the application of altimetry data on **different scenarios**, together with tutorial material on altimetry from **LRM** to **SAR**.

• **All material** can be consulted **directly on the website or downloaded as a book** (PDF).

• We also provide a **forum**, where you can talk with us or other members of the altimetry community.

• If you visit our **YouTube channel**, you can see videos that will guide on how to use **BRAT** through several operations ([http://bit.ly/bratvideo](http://bit.ly/bratvideo)).
GUT (GOCE User Toolbox)

- **GUT** is a compilation of *open-source tools* for the inspection and analysis of gravity field data products.
- Made specifically for **GOCE Level 2** products, now also supports **GRACE Level 2** products, as well as any *gravity models in the ICGEM* format.
- Provides users with **140 processing units**, from computing gravity anomalies to calculating mean dynamic topographies.
- The processing units can be combined by means of *workflows* allowing users to create more and more *complex operations from simple blocks*.
- GUT comes with **70 prebuilt workflows** oriented to *Geodesy, Solid Earth Physics*, and *Oceanography*.
- Expandable by *user-built workflows* and *processing units* (C, C++, Fortran).
GUT (GOCE User Toolbox)

- The **last version 3.1** has been improved with a **GUI** that allows users to create data processing workflows by **visual programming**, able to run on Linux, Windows, or macOS.
The toolbox comes with two companion documents:

a) a **User Guide** that describes all the **algorithms** used in GUT, plus some of the **theoretical background**;

b) a **Tutorial** with **42 use cases**, with all the used files included with **GUT**, guiding a user through a multitude of scenarios. **Perfect for the classroom!**
Thank you!

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http://earth.esa.int/brat
http://altimetry.info/

For any questions
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