

→ **ADVANCED ATMOSPHERIC TRAINING COURSE 2014**

Practical on Data Handling BEAT Toolbox

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Introducing BEAT

BEAT: the **B**asic **E**nvisat/**E**RS **A**tmospheric **T**oolbox

Goal: to provide the necessary software to support scientific analysis of atmospheric data.

BEAT supports three layers of functionality:

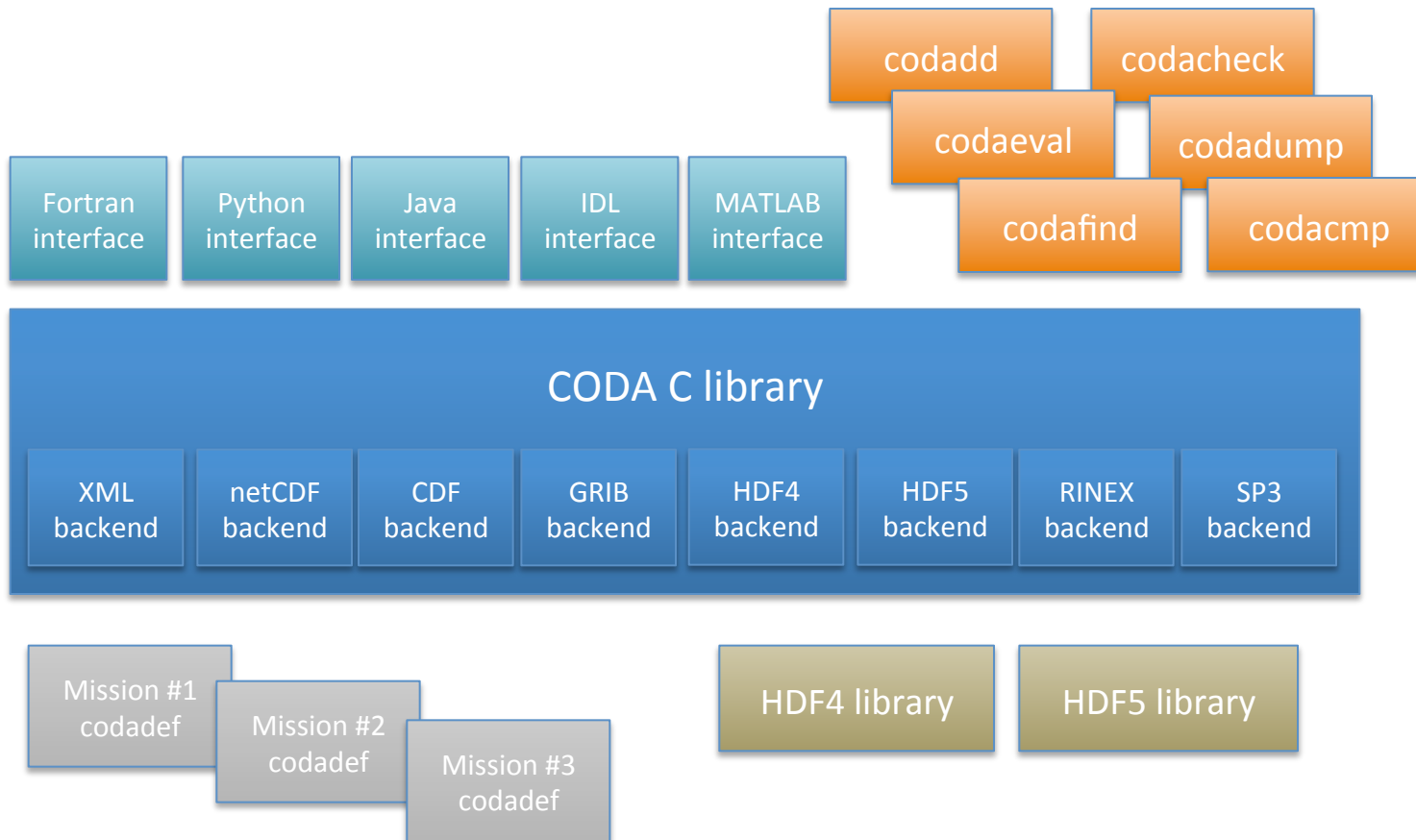
- **CODA** *direct product interface*
- **BEAT-II** *simplified data interface*
- **VISAN** *visualization & analysis application*

For this course, we will focus on **BEAT-II** and **VISAN**.

CODA

- Single interface to read any data from a product
- Very direct mapping to the data in a product
- Requires user to have knowledge about the product structure
- Function interfaces for C, Fortran, Java, Python, IDL, and MATLAB
- Useful command line tools

CODA



BEAT-II

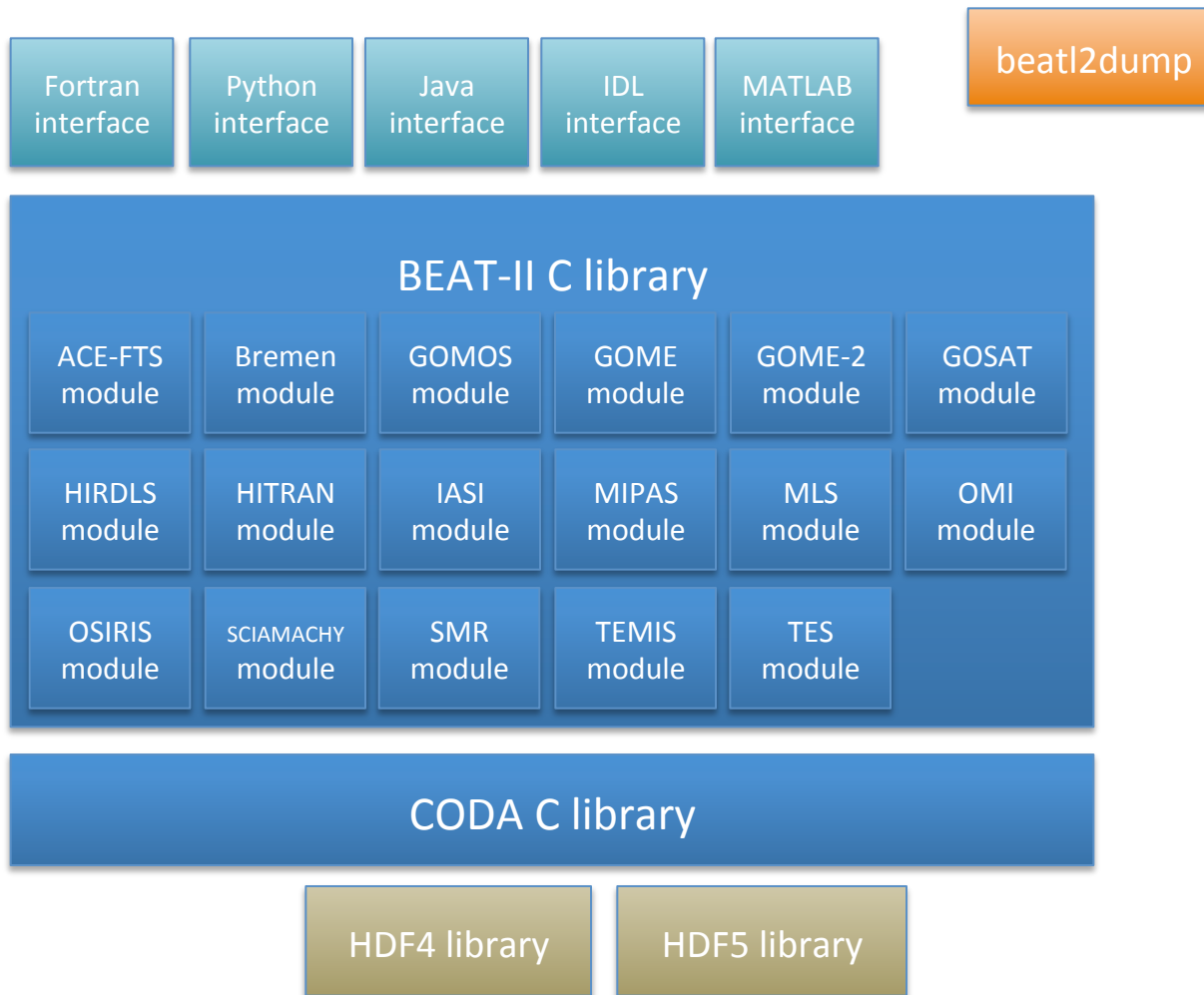
Why two different interfaces?

- Many data products have a very complicated structure that reflect the way data-processors work, not the way end-users look at the data.
- Correct matching of measured spectra/retrievals to geolocation (“ground pixels”) can be hard to get right.
- For typical analysis work, only a fraction of the data within the file is useful.
- It is difficult to compare data from different instruments.
- BEAT-II addresses these issues by providing a simplified (but still valid!) view on the data.

BEAT-II

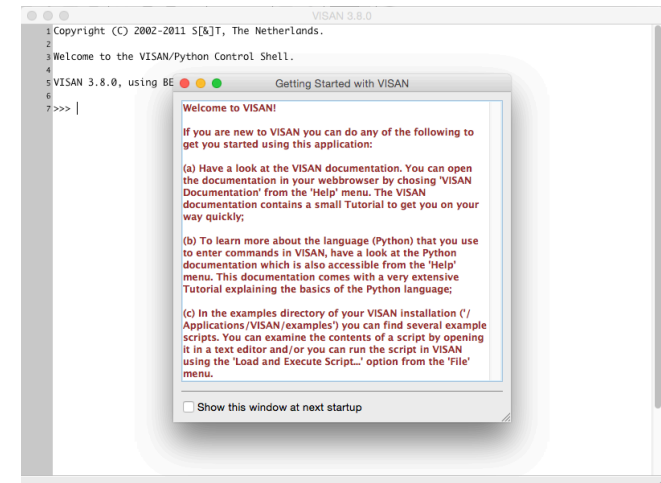
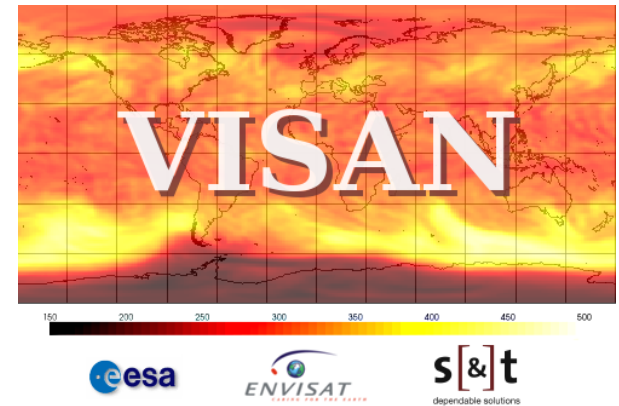
- Only one call needed to ingest the most important data from a single product or multiple products
- Ingest product data into 'flat' BEAT-II records
- Powerful ingestion filter options to determine which parameters to ingest and to put restrictions on time, location, etc.
- BEAT-II records use native data type for each interface (e.g. 'struct' for MATLAB/IDL, 'object' for Python)
- Each field corresponds with a specific scientific parameter
- Fields use standardized naming convention and provide data in standardized units, thus allowing easy comparison

BEAT-II



VISAN

- Ingest data using CODA and BEAT-II
- Python language for command input and performing calculations and manipulations
- With one function call, create interactive 2D and World plot visualizations of your data
- Open Source and Cross-Platform: Windows, Linux, and Mac OS X.



BEAT Future

New features coming in 2015 and beyond

- BEAT-II -> HARP
 - automatic unit and parameter conversion
 - vertical profile calculations (smoothing, resampling, integration)
 - collocation
- New missions:
 - **Sentinel 5P**
 - NPP Suomi
 - Atmospheric CCI
 - *Aeolus*
 - *EarthCARE*