



pydiva2d: a python interface to the DIVA interpolation software

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The Data-Interpolating Variational Analysis (DIVA) is designed to interpolate in situ observations taking into account the specificities of oceanographic data:

- Spatio-temporal distribution of the data: numerous data but irregularly distributed; more frequent in summer, ...
- Different types of error: instrumental, representativity.
- Separation of sub-domains by physical boundaries (coastlines, straits, ...).
- Preferential directions of propagation of the information: isobaths, currents, ...

The code itself is a set of Fortran routines called by bash scripts that also move and rename the input and output files.

In order to make easier the execution of DIVA, specific python modules were written. The idea is that the user does not have to know the internal directory structure and the file nomenclature, but only has to provide the data and the set of analysis parameters. In this object-oriented approach, each DIVA input (contours, data, parameters) and main output (mesh, analysis) has its own class, and each class has methods to read, write and display the information from/to several formats.

Different applications are presented in the form of Jupyter notebooks to illustrate the available features. The notebooks constitute nice examples of how to describe the usual DIVA workflow: data and parameter reading, finite-element mesh creation and analysis. Figures or interactive Leaflet maps can easily be created according to user's needs.

The code is available from Github: <https://github.com/gher-ulg/DivaPythonTools> and Zenodo: <https://zenodo.org/record/838193.W1X47PaQzjo>