

# SismoVi a tool for seismic wave modelling & analysis

**Authors:** Francesco Apostolico, Géza Seriani

**email:** [sismovi@ogs.trieste.it](mailto:sismovi@ogs.trieste.it)

**web:** [www.spice-rtn.org/sismovi](http://www.spice-rtn.org/sismovi)

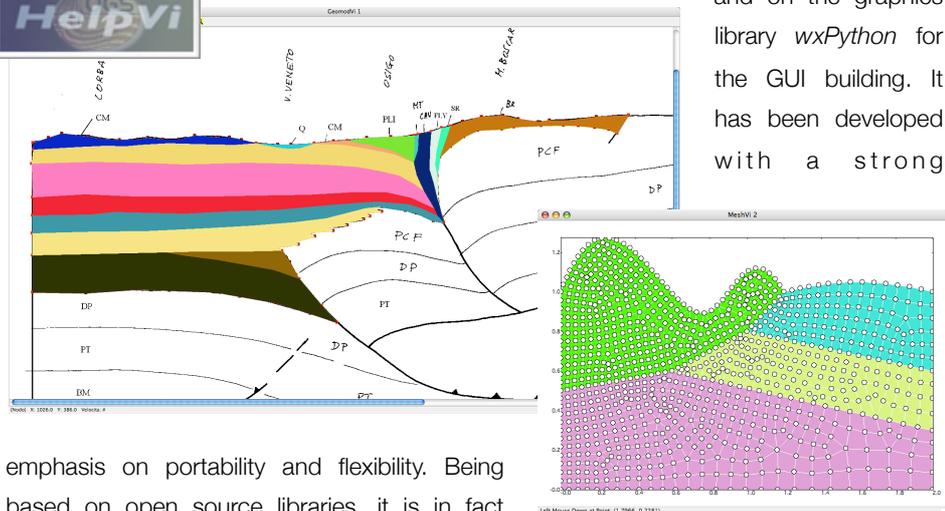
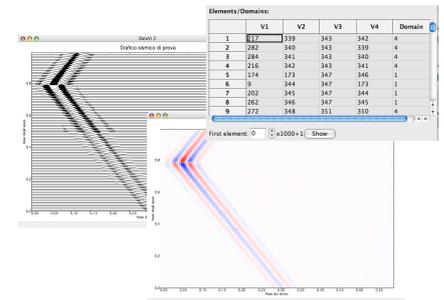
## An interactive pre- & post-processing



Seismic wave modelling analysis in complex geological structures is a task that requires three main phases: a pre-processing phase, a numerical simulation phase and a post-processing phase. In order to be effective, numerical simulation studies need to use efficient computational algorithms and pre- and post-processing tools based on computer aided modules. The ultimate goal of these tools is to facilitate the preparation of the geological models and to speed up the related definition process of the input data needed by the wave simulation codes. Moreover, they must help in the final analysis of the results obtained from the numerical experiments.

**SismoVi** has been developed having in mind these needs and the specific constraints which are typical in geophysics and geology. It is a pre-/post-processing tool based on the scripting language *Python*

and on the graphics library *wxPython* for the GUI building. It has been developed with a strong



emphasis on portability and flexibility. Being based on open source libraries, it is in fact portable on almost all computer systems. Its functionalities can be easily extended with the help of various *Python* libraries that are available for different purposes like graphics, data base management, scientific computing, image processing, and many others. Moreover, the full power of the language is available to the end user who can easily interact with the data on the fly, making transformations of them and viewing the results. Thank to the mathematical libraries, high level operators and functions are available. Furthermore, the available array syntax, which is very similar to that one in *FORTRAN 90*, *Matlab* and *Mathematica*, allows for computationally very efficient evaluations.

### Main features

- Three interactive integrated modules
  - ▶ **GeomodVi** for geological model generation from geological maps
  - ▶ **MeshVi** for visualisation and editing of computational grids
  - ▶ **DataVi** for visualisation and data processing of seismograms
- Computing platform independent
- Developed in *Python* & *wxPython*
- Interactive shell for data processing and visualisation
- Efficient array syntax
- Scientific operators and functions
- Plotting libraries *matplotlib*

