

BSIT: Barcelona Subsurface Imaging Tools

Geophysical exploration is a field with huge amount of computational resources needs. BSIT platform was developed to cope with such needs, including different type of processing systems running over a wide range of HPC architectures. The main systems included in BSIT are:

- **Forward Modeling**
- **Reverse Time Migration**
- **Full Waveform Inversion**

In addition, the software supports **different rheologies** including: acoustic, acoustic with variable density, elastic, viscoelastic and electromagnetic. Moreover, several levels of anisotropy are supported: VTI/HTI, Orthorhombic, TTI and arbitrary anisotropy (for elastic and viscoelastic rheologies).

BSIT is based on two software frameworks, which are:

- **Environment for Assessing Performance (EAP)**: provides the means to enhance the processing of the most time-consuming parts of the geophysical processing algorithm at hand. In our case, mostly the wave propagation. This framework is mainly maintained under the *HPC Frameworks* research line.
- **Environment for Assessing Confidence (EAC)**: provides the means to support a resilient processing of complete imaging surveys, from massive input and output to checkpointing, the detection and recovery from failures, input and output data corruption checking, or whole system restart upon critical errors. This framework is mainly maintained under the *HPC Workflows* research line.

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