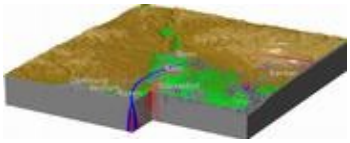
# Scope

The theory and applications of acoustic (elastic, seismic) **wave propagation** are entering a new era in fields such as seismology, oceanography, meteorology, acoustics, engineering, material sciences, medical sciences and others. In the past ten years the methodologies used in those fields have dramatically converged due to the massive use of **numerical methods**. Modern computational techniques in combination with **parallel computer architectures** allow the simulation of the complete **three−dimensional phenomena** of wave propagation for **realistic complex structures** with unprecedented detail. This suggests that the reverse processes (e.g. **imaging** of the Earth's internal structure, physical description of hydrocarbon **reservoirs,** monitoring of zones of weakness in constructions, characterization of **earthquake rupture processes**, etc.) will experience a quantum jump in resolution and accuracy over the next decade.

The SPICE Consortium aims at integrating institutions with specialisations in **physical, mathematical, geological, and computational aspects of wave propagation**. The goal is to develop, verify and apply computational tools for wave propagation and imaging problems on all scales. With the novel computational algorithms we expect breakthroughs in (1) the determination of **global Earth structure**; (2) the quantitative estimation of **shaking hazard**; (3) the characterization and monitoring of **reservoirs;** (4) understanding the structure and processes inside **volcanoes;** (5) simulating the physical processes of **earthquake rupture**; and (6) characterizing the small−scale **properties of rocks**.

Computational methodologies play an increasingly important role in Earth Sciences. However, the curricula are not able to provide the required teaching to equip young scientists with the necessary background in mathematical and computational aspects of a rapidly expanding field. The goal of the proposed network is to compensate for this and to provide **open training facilities** for the next generation of researchers in the field of computational wave propagation. This shall be achieved by regular **training courses** involving the network team and leading scientists in the associated fields of research.

Images



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