



## **Geophysical instrumentation through topical compute clusters**

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An increasingly important instrument in geophysics are high-end parallel computer arrays aimed directly at performing demanding geophysical simulations in a dedicated mode. This operational mode is commonly referred to as topical computing, and the arrays are known as clusters. We have built a 150 processor geophysical modeling cluster through funding from the German Science Foundation exploiting a decade worth of experience in cluster design and usage. The machine is based on Opteron architecture, Gigabit Ethernet and a Netapp storage system. About 150 GB main memory and a file system space of 5 TB is available through the system. The new machine is dedicated to global seismic wave propagation simulations in the frequency range of 20 seconds and global geodynamic calculations capable of resolving Earth's mantle upper thermal boundary layer. Similar sized systems as well as systems of much larger size are currently being deployed in geophysical modeling throughout Europe and North America. We observe that topical compute clusters are likely to continue to grow in importance, reflecting their superior price performance which is well suited to capacity computing.