

MODELING OF GEOLOGICAL STRUCTURES AND SURFACE OBSERVATIONS

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Modeling of geological structures is a major aspect in understanding the various processes involved in the evolution of Earth's crust and mantle. Rocks distributed over a region and also in the subsurface provide a distinct response on the surface measurements due to variations in their physico-chemical properties. Careful study of multi-dimensional, multi-parametric responses by mathematical and physical modeling and also the integration is a necessary requirement to arrive at a more realistic and meaningful understanding of the Earth's interior. It is thus expected that use of inversion algorithms for multiple datasets to derive Earth's structure is becoming more common. The derived models are further studied by varying the parameters for assessment and also to understand the geological processes. This study describes certain thermo-mechanical, electrical, seismological, hydrological and statistical models proposed for different terrains such as collision zones, active tectonics, cratonic areas, geothermal reservoirs, mineralized zones, deep hot plumes, earthquake zones, water reservoir areas etc. and discuss with special reference to complex areas of Indian Geology.