

1106-AC-264

**Alik Ismail-Zadeh\*** ([alikh.ismail-zadeh@kit.edu](mailto:alikh.ismail-zadeh@kit.edu)), IEPTMG, Russian Academy of Sciences, Moscow, Russia; also KIT, Karlsruhe, Germany. *Inverse Retrospective Problems in Dynamics of the Earth's Interior*.

The Earth's dynamics (characterized basically by a temperature and flow in the mantle) can be described by mathematical models, i.e., by a set of partial differential equations (e.g., the Stokes equations, the heat balance equation, the equation of state and the rheological law) and boundary and initial conditions defined in a specific domain. Present geophysical and geodetic observations provide a clue to understanding dynamics of the Earth interior in the geological past. Assimilation of present observations allows to constrain the mantle temperature and flow in the past using the dynamical mathematical models. Quantitative tools are required to assimilate the data and hence to solve inverse retrospective problems in geodynamics. The basic inversion methods (the backward advecton, adjoint, and quasi-reversibility techniques) and their applicability to restore the evolution of the Earth interior will be presented and discussed. (Received August 17, 2014)