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Mantle viscosity, glacial changes and sea-level rise

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Deformation and gravity fields can be used to trace various processes in the earth system. An important example of such processes is the glacial-isostatic adjustment of the viscoelastic earth. Whereas the adjustment caused by the melting of the Pleistocene ice sheets is a 'classical' topic, the effects of variations in the present-day continental ice cover have only received greater attention during the last decade. The main objectives of studying glacial-isostatic adjustment are the determination of

- the mantle viscosity (including its radial and lateral variations),
- the mass balance of today's ice sheets, ice caps and glaciers,
- the global sea-level rise in consequence of recent climate change.

The presentation gives an overview of the modelling work conducted at the GeoForschungsZentrum Potsdam and presents examples showing the complex interactions between Pleistocene and recent glacial changes, the earth's viscoelastic response and sea-level variations.