Contribution ID: **4** Type: **talk**

General Relativistic geodesy - a new shape of the earth

Wednesday, 7 July 2021 15:25 (1 minute)

Owing to new highly sensitive devices like clocks, freely falling particles, spinning tops, and laser and atom interferometers on ground and in space the relativistic gravitational field of the Earth can now be measured with unprecedented accuracy. This requires a relativistic formulation of geodesy. Here a fully general relativistic scheme for geodesy is presented. Starting from stationarity two geoids can be defined for the Earth, one related to the norm of the underlying Killing vector, the other related to its twist. The first one can be measured with clocks on ground and in space, falling bodies, or atom interferometry, the other can be measured with spinning tops or by measuring a Sagnac effect with laser or atom interferometry. For using clocks in space a special approach is needed taking into account the non-stationarity of the moving clocks. Finally, based on analyses by Hansen, Simon, and Beig a scheme is presented for measuring the full gravitational field of the Earth using laser interferometry employed by GRACE Follow On.

Primary author: LAEMMERZAHL, Claus (University of Bremen)

Presenter: LAEMMERZAHL, Claus (University of Bremen)

Session Classification: Recorder Talks: Geodesy and Ranging