

Track: Optical Frequency Standards And Applications

Title: Relativistic geodesy with clocks

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Abstract: The recent progress in optical atomic clocks and in long-distance frequency transfer by optical fiber together pave the way for using measurements of the gravitational frequency redshift for geodesy. The remote comparison of frequencies generated by calibrated clocks will allow for a purely relativistic determination of differences in gravitational potential and height between stations on Earth surface (chronometric leveling). Experiments for the proof of concept for this technique are currently in preparation at Leibniz Universität and Physikalisch-Technische Bundesanstalt (PTB). If successful, the technique could on the long run provide the basis for an atomic height reference and a relativistic geoid definition.