

A new absolute gravity base in the German Alps

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Abstract: Within a cooperation between the *Institut für Astronomische und Physikalische Geodäsie* (IAPG), München, and the *Institut für Erdmessung* (IfE), Hannover, four new absolute gravity stations were established in the German Alps during the autumn season of 2004, a period with minimum snow coverage. Two stations are located close to the summit of the mountain Zugspitze, while the other two stations are situated at the foot and at the top of the mountain Wank. The four stations cover an elevation range of 2200 m and a gravity range of 0.00522 m/s^2 ($\equiv 0.522 \text{ Gal}$). The accuracy of each station determination is assumed to be within ± 20 to 40 nm/s^2 . The main purpose of the new gravity base net is to serve as a high-precision long-range gravity calibration line for the determination of linear and quadratic calibration terms of modern relative gravimeters. The precision of the calibration line is in the order of $\pm 5 \times 10^{-5}$ which also considers uncertainties from unmodelled temporary gravity changes due to snow accumulation over a year.

Key words: absolute gravimetry, long-range gravimeter calibration line, German Alps

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