



## **The pitfalls of using GPS and levelling data to test gravity field models**

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It has become commonplace to verify global and regional geoid models using co-located GPS and levelling data. However, these datasets have their own error budgets, as well as some conceptual differences from the classical geoid. Key elements include: gross, systematic and random errors in both observation types; the quality and vintage of the GPS data; the height system used for the levelling observations; and the quality and vintage of the vertical geodetic datum. As such, GPS-levelling data do not provide equivocal verification of geoid models. This paper discusses the various pitfalls, so as to make the users and producers of geoid models more aware of the problems that can be encountered when adopting this form of verification.