

Special issue on
Instrumentation for ground-based gravimetry: state of the art and emerging technologies
in IEEE Instrumentation & Measurement Magazine, to be published in September 2024

Knowledge of the spatio-temporal changes in the characteristics and distribution of subsurface fluids is key to properly addressing important societal issues, including: sustainable management of energy resources (e.g., hydrocarbons and geothermal energy), management of water resources, and assessment of hazard (e.g., volcanic eruptions). Gravimetry is the only geophysical method that can directly detect changes in subsurface mass, thus providing a window into processes that involve deep fluids.

Applications of ground-based gravity monitoring to subsurface fluid characterization are diverse; they include tracking groundwater mass redistributions and assessing changes due to oil and gas production, CO₂ sequestration, and geothermal resource exploitation. In the field of volcanology, gravimetry affords a means of identifying subsurface processes that may otherwise remain undetected (e.g., magma accumulation in pre-existing void space).

Despite its huge potential, ground-based gravimetry is an underexploited geophysical method, mostly because of instrumental issues, that have limited its use, especially under harsh field conditions. Ongoing and future developments are expected to address the above issues, thus broadening the application of ground-based gravimetry.

Papers should present to the wide audience a general overview of one scientific subject of your interest fitting the Special Issue Topic and really framed in the Instrumentation and Measurement field.

Contributions dealing with Open Problems in IM are very welcome, also presenting challenging and ambitious solutions, which could be developed by current and advanced technology.

While drafting your paper to be submitted to IMM, you are strongly invited:

- to follow authors guidelines, both for styling and contents: <https://iee-ims.org/publication/ieee-imm/new-submissions>
- to make sure your article is properly framed in the field of Instrumentation and Measurement. This could be achieved by properly structuring the Review of the State of the Art and motivations of your work.
- to draft the paper for the general I&M audience.

In general, each paper should contain 3500-5000 words, and present 4-6 figures.

When your paper is ready, please submit it completely through

<https://www.editorialmanager.com/IMM/default.aspx>

We expect to receive your paper by December 2023, to begin the review and production process.

With your submission, please include a cover letter where you specify that this paper has been submitted for the SI on *Instrumentation for ground-based gravimetry: state of the art and emerging technologies*.

Schedule:

Full-length paper submission:	December 2023
Revised manuscript due:	March 2024
Final acceptance notification :	April 2024
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