CARIOQA-PMP

What is the difference between measuring gravity from Earth and from space?

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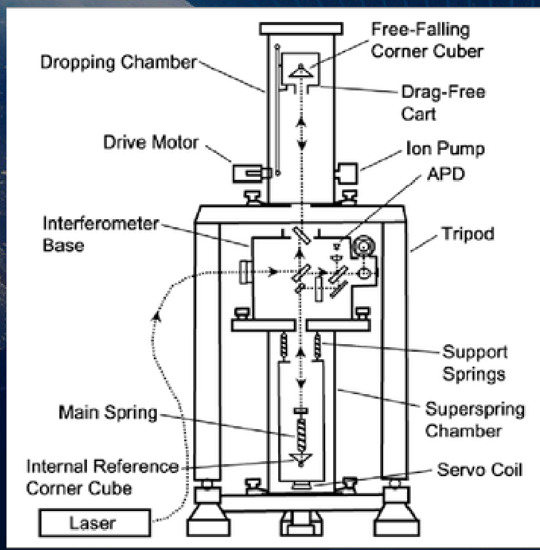
Today, gravimeters are the most common technology for measuring gravity from the ground. Gravimeters operate by detecting the displacement of a mass suspended on a spring due to gravitational pull. These instruments can detect temporal variations in gravity caused by mass redistribution, such as ice melting.

However, these technologies only provide local measurements of the gravitational field, limiting our understanding of global gravitational phenomena, such as the impact of global warming on sea levels. To better understand these global phenomena, measuring gravity from space is particularly valuable. This method involves very precisely measuring the distance between two satellites in the same orbit. As the first satellite, then the second, passes over a gravity anomaly on Earth, this distance changes. To deduce the value of the gravity anomaly, the measurements must be corrected for other non-gravitational forces acting on the satellites, such as atmospheric drag. For this reason, each satellite must carry an ultra-precise accelerometer.

Graphic representation of an absolute gravimeter



©Absolute gravimetry with the Hannover meters JILAg-3 and FG5-220, and their deployment in a Danish-German cooperation

The aim of the CARIOQA-PMP project is to design a revolutionary quantum accelerometer that will improve the accuracy of these measurements, enabling us to better map the temporal variations in gravity that reflect global changes on our planet.

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