Mobile high precision absolute gravimeter realized by ^{85}Rb cold atom interferometry

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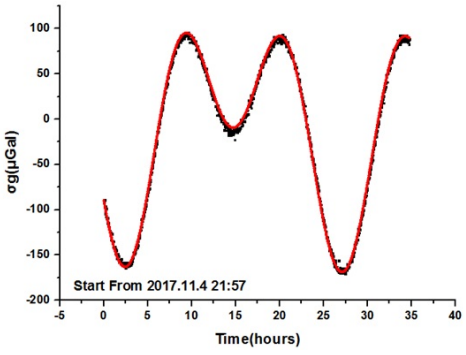
The absolute value of local gravity and its change over time is of great significant for research in seismology, geophysics and inertial navigation. The mainstream equipment to perform this high precision gravity measurement are falling corner-cube and superconducting gravimeters until now. Here, we develop a mobile absolute gravimeter based on ^{85}Rb atom interferometry[1] with compact laser optics, active vibration isolation[2] and Coriolis compensation subsystems. The short-term noise and long-term stability of our atom gravimeter are 30μGal/√Hz and 0.8μGal respectively. This gravimeter realized high precision measurement on three different locations in which some of them even with harsh vibration isolation and temperature control environment. Eventually, our atom gravimeter participated in the ICAG2017 (International Comparison of Absolute Gravimeters) in Beijing last November.



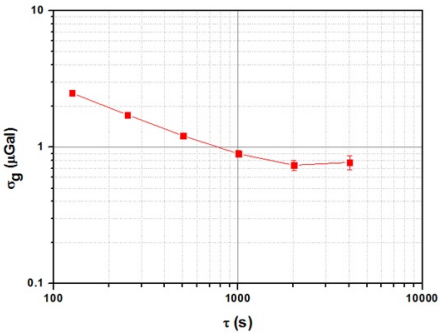


Fig. 1. Measurement of solid tide by our atom gravimeter and the Allan variance.

Keywords: Cold atom interferometry, Atom gravimeter.

References

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