

# Atomic Interferometric Gravitational-wave Space Observatory (AIGSO)

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We propose a space-borne gravitational-wave detection scheme, called atom interferometric gravitational-wave space observatory (AIGSO) [1]. It is motivated by the progress in the atomic matter-wave interferometry, which solely utilizes the standing light waves to split, deflect and recombine the atomic beam. Our scheme consists of three drag-free satellites orbiting the Earth. The phase shift of AIGSO is dominated by the Sagnac effect of gravitational-waves, which is proportional to the area enclosed by the atom interferometer, the frequency and amplitude of gravitational-waves. The scheme has a strain sensitivity  $< 10^{-20}/\sqrt{\text{Hz}}$  in the 100 mHz-10 Hz frequency range, which fills in the detection gap between space-based and ground-based laser interferometric detectors. Thus, our proposed AIGSO can be a good complementary detection scheme to the space-borne laser interferometric schemes, such as LISA. Considering the current status of relevant technology readiness, we expect our AIGSO to be a promising candidate for the future space-based gravitational-wave detection plan.

**Keywords:** Atom interferometer, Gravitational-wave detection

## References

- [1] Dongfeng Gao, Jin Wang, and Mingsheng Zhan, Atomic Interferometric Gravitational-wave Space Observatory (AIGSO), *Commun. Theor. Phys.* **69**, 37 (2018).