

ZAIGA: Zhaoshan long-baseline Atom Interferometer Gravitation Antenna

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ZAIGA (Zhaoshan long-baseline Atom Interferometer Gravitation Antenna) is an underground laboratory aimed to do various gravitational experiments with atomic techniques, which is currently under construction [1]. It is located in the 200-meter-on-average underground of Zhaoshan, about 80 km southeast to Wuhan. In this talk, I will focus on ZAIGA-GW plan, which is an underground laser-linked atom interferometer gravitational-wave detector. It will be equipped with the latest atom interferometry and will take an equilateral triangle configuration, with two 3-km-apart atom interferometers in each arm. Given the proposed strain sensitivity $< 10^{-20}/\sqrt{\text{Hz}}$ in the middle frequency band (0.1 Hz-10 Hz), the detector will be able to detect the gravitational-waves from the intermediate-mass black hole binaries within the distance of 10 Gpc, and the stellar-mass black hole binaries up to the distance of 1 Gpc. Thus, ZAIGA-GW can fill in the detection gap between the ground-based laser interferometric GW detectors (such as LIGO, VIRGO and KAGRA) and the future space-based GW detectors (such as LISA).

Keywords: Atom interferometer, Gravitational-wave detection

References

- [1] The ZAIGA collaboration, ZAIGA: Zhaoshan long-baseline Atom Interferometer Gravitation Antenna, to appear in International Journal of Modern Physics D **28**, xxxx, 2019.