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Orbit and Constellation Design for TianQin: Progress Review

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The TianQin mission plans to deploy three drag-free controlled satellites in circular high Earth orbits at an altitude of 10^5 km. The satellites form a nearly equilateral-triangle constellation, and exchange high-precision laser interferometric links to detect low-frequency gravitational waves in the mHz frequency band. TianQin features a geocentric concept, and is facing the challenge of designing and utilizing high Earth orbits to the best effect. In this talk, we briefly summarize main progresses on TianQin's orbit and constellation design, including constellation stability optimization, orbital orientation and radius selection, the Earth-Moon's gravity disturbance evaluation, and eclipse avoidance (Ye et al, IJMPD 1950121(2019), Tan et al, IJMPD 2050056(2020), Zhang et al, PRD 062001(2021), Ye et al, PRD 042007(2021), Zhou et al, PRD 103026(2021)).

Author: ZHANG, Xuefeng (Sun Yat-sen University)

Co-authors: YE, Bobing; TAN, Zhuangbin; LUO, Chengjian; TIANQIN TEAM

Presenter: ZHANG, Xuefeng (Sun Yat-sen University)

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