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Artificial Precision Timing Array: bridging the decihertz gravitational-wave sensitivity gap with clock satellites

Thursday, 11 July 2024 18:00 (30 minutes)

Gravitational-wave astronomy has achieved remarkable progress over the past decades, detecting waves across a wide range of frequencies. However, the band around one Hz remains unexplored. This band is vital for studying some of the most fascinating sources, including intermediate-mass binary black hole mergers, early inspiralling compact binaries, and possibly cosmic inflation. The Artificial Precision Timing Array (APTA), a new detector concept based on pulsar timing principles, aims to access this intriguing band. APTA aims to use precision-clock-carrying satellites that emit pulsing signals towards a central point. This talk will discuss the APTA concept and the clock precision required for its successful detection of gravitational waves. With advancements in clock technology anticipated within the next decade, APTA could detect a wide range of astrophysical sources, opening a new research area focused on designing and constructing gravitational-wave detectors based on pulsar timing principles.

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Session Classification: Mid-frequency gravitational waves (0.1-10 Hz): sources and detection methods

Track Classification: Gravitational Waves (GW): Mid-frequency gravitational waves (0.1-10 Hz): sources and detection methods