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Sub-femtoWatt Laser Phase tracking for space-based gravitational wave detection

Wednesday, 24 May 2023 19:00 (15 minutes)

This talk presents a demonstration of robust phase tracking in the weak-light regime (10 femtoWatts and below). In addition we present modelling, simulation and experimental work that demonstrate, for the first time, phase tracking at the sub-femtowatt level, more than 1,000 times less optical power than what is planned for the Laser Interferometer Space Antenna (LISA). As well as improving on the previous results in the field, this work addresses the gap in our understanding of how these phase tracking behave in the weak-light regime. This technology is mission enabling for missions such as microHertz band space-based gravitational wave detectors and improves relaxes requirements on received optical power for other space-based interferometric missions.

Primary author: SAMBRIDGE, Callum

Co-authors: WADE, Andrew (Australian national university); Mr SUTTON, Andrew (Australian National University); SHADDOCK, Daniel (Australian National University); Ms ROSEREES, Emily (Australian National University); Mr VALLIYAKALAYIL, Jobin (Australian National University); ZHANG, Jue (Australian National University); MCKENZIE, Kirk; CHABBRA, Namisha (Australian National University); Mr ROBERTS, Lyle (Australian National University)

Presenter: SAMBRIDGE, Callum

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