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Kinematic Anisotropies in the SGWB: detection from PTA-Astrometry synergies

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Recent Pulsar Timing Array (PTA) observations provide strong evidence for a stochastic gravitational wave background (SGWB), potentially originating from astrophysical sources or early universe phenomena. If the SGWB is cosmological, our relative motion with respect to the SGWB rest frame induces a kinematic anisotropy, which could dominate over intrinsic anisotropies, similar to the cosmic microwave background dipole. We studied PTA sensitivity to this dipole and forecasted its detectability with future experiments like SKA. Additionally, astrometry is a complementary method to PTA observations, and by cross-correlating astrometric and PTA data, constraints on SGWB properties can be improved, aiding in determining its origin.

Author: JIMENEZ CRUZ, Nayeli Marisol (Swansea University)

Presenter: JIMENEZ CRUZ, Nayeli Marisol (Swansea University)

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