A spectropolarimetric method for predicting the gravitational-wave polarization of LISA verification binaries

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Abstract

Verification binaries are compact Galactic binaries with orbital periods of a few hours are gravitational wave sources in the mHz regime that are expected to be detected by the Laser Interferometer Space Antenna (LISA) and other future GW detectors. Binary system parameters such as the inclination, orientation and distance are needed to provide an accurate prediction of the gravitational wave strain. A full gravitational wave polarisation prediction requires resolving the orientation of the binary orbit in the sky. We suggest that spectropolarimetry could be used to detect the polarized light originating at the brighter star but scattered off the fainter star, and hence measure the orientation of a verification binary. A good candidate is the cataclysmic variable (AM CVn) *HP Lib*.