Polarization prediction of LISA verification binary using spectropolarimetry

October 2, 2020

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. One such candidate is the cataclysmic variable binary (AM CVn) *HP Lib* consisting of a high mass white dwarf accretor and a a low mass brown dwarf donor of mass. 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 use the method of spectropolarimetry to estimate the orientation of the binary HP Lib. We estimate that the light reflected from the brighter source will provide a good signal to noise ratio to resolve the polarization.