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Recent studies on the propagation velocity of lensed gravitational waves

Monday 1 February 2021 22:00 (25 minutes)

In this talk, we briefly review the propagation velocity of lensed gravitational waves in general relativity, based on recent papers (listed below). We mainly discuss the velocity difference between GWs and electromagnetic waves (EMWs) in the presence of a lens. The lensing of EMWs is usually studied in geometrical optics, while the lensing of GWs should be studied in wave optics if the wavelength is larger than the Schwarzschild radius of the lens. The recent studies reveal that the phase and group velocities of GWs can exceed the velocity of EMWs, but the wave front never arrives before the EMWs if both waves were emitted simultaneously from the source. Finally, we discuss an observational possibility to detect the arrival-time difference. References: RT (2017), Morita & Soda (2019), Suyama (2020), Ezquiaga+ (2020)

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