

# Astrophysical scenarios leading to gravitational wave modification

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Calculations of gravitational waves (GWs), both analytical and numerical, assume that they propagate from source to a detector on Earth in a vacuum spacetime. Whilst the average cosmological density of baryonic plus dark matter is small, a detected GW event may be a considerable distance away from its source, up to order 1 Gpc, and the quantity of intervening matter may not be negligible. Furthermore, there is the possibility that the astrophysical environment of a source event may be such that the source is surrounded by a substantial amount of matter. As we enter into an era of precision GW measurements, it is important to quantify any effects due to the propagation of GWs through a non-vacuum spacetime

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