

General Relativity and Quantum Cosmology

Gravitomagnetism and gravitational waves

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After extensively reviewing general relativistic gravitomagnetism, both historically and phenomenologically, we review in detail the so-called magnetic components of gravitational waves (GWs), which have to be taken into account in the context of the total response functions of interferometers for GWs propagating from arbitrary directions. Following the more recent approaches of this important issue, the analysis of such magnetic components will be reviewed in both of standard General Theory of Relativity (GTR) and Scalar Tensor Gravity. Thus, we show in detail that such a magnetic component becomes particularly important in the high-frequency portion of the range of ground based interferometers for GWs which arises from the two different theories of gravity. Our reviewed results show that if one neglects the magnetic contribution to the gravitational field of a GW, approximately 15% of the potential observable signal could, in principle, be lost.

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