Sixteenth Marcel Grossmann Meeting



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Gravitational perturbations in the Newman-Penrose formalism: Applications to wormholes

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In this work we study the problem of linear stability of gravitational perturbations in stationary and spherically symmetric wormholes. For this purpose, we employ the Newman-Penrose formalism which is well-suited for treating gravitational radiation in General Relativity, as well as the geometrical aspect of this theory. With this method we obtain a "master equation" that describes the behavior of gravitational perturbations that are of odd-parity in the Regge-Wheeler gauge. This equation is later applied to a specific class of Morris-Thorne wormholes. The analysis of the equation yielded by this class of space-times reveals that there are no unstable vibrational modes generated by the type of perturbations here studied.

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