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Is Quadratic Gravity Stable? DIMITRY AYZENBERG, KENT YAGI, NICOLAS YUNES, Montana State Univ — As the advanced gravitational wave detector era approaches it is vital to understand and analytically test the wide range of alternative theories to General Relativity. An important analytical test is a stability analysis as any instabilities arising due to perturbations suggest the theory to be invalid. In this talk I present our results of a stability analysis of dynamical, quadratic gravity to linear order in the perturbation and coupling constant in the high-frequency, geometric optics approximation. This analysis is based on a study of gravitational and scalar modes propagating on spherically-symmetric and axially-symmetric, vacuum solutions of the theory. We find dispersion relations that do not lead to exponential growth of the propagating modes, suggesting the theory is linearly stable on these backgrounds. The modes are found to propagate at subluminal and superluminal speeds, depending on the propagating modes' direction relative to the background geometry.

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