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Effective Gravitational Wave Stress-energy Tensor in Alternative Theories of Gravity LEO STEIN, MIT Kavli Institute — The inspiral of binary systems in vacuum is controlled by the rate of change of the system's energy and angular momentum. In alternative theories, such a change is induced by the effective stress-energy carried away by gravitational radiation and any other propagating degrees of freedom. We employ perturbation theory and the short- wavelength approximation to compute this stress-energy tensor in a wide class of alternative theories. This tensor is generally a modification of that first computed by Isaacson, where the corrections can dominate over the general relativistic term. In a wide class of theories, however, these corrections identically vanish at asymptotically flat, future, null infinity, reducing the stress-energy tensor to Isaacson's. We consider a wide class of theories with dynamical scalar fields coupled to higher-order curvature invariants, and show that the gravitational wave stress-energy tensor still reduces to Isaacson's.

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