Effective Field Theory Approach to Binary Systems in Scalar-Tensor Theories

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Theories beyond General Relativity typically contain at least one additional scalar degree of freedom, which effectively mediates an additional force. While this force must be highly suppressed in low-density environments–in order to pass current constraints–it generically leads to deviations from General Relativity in high-density / high-curvature environments, such as neutron stars and black holes, and thus impacts their observables. I will discuss how binary systems in scalar-tensor theories can be treated using an effective field theory approach and present results regarding observables such as the energy loss and the gravitational wave spectrum.

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