

Hairy Extreme mass ratio inspirals

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The presence of scalar 'hair' around a black hole could have signatures in the waveform produced by inspiralling objects. We propose a unifying description of hairy inspirals in the extreme mass ratio case when a single scalar field is present in the action, and we derive the dissipated power in the odd sector of the perturbations up to 3.5PN order beyond the quadrupole formula. Our formalism relies on an effective field theory setup previously considered for inflation, dark energy, and quasi-normal modes ; the deviations from General Relativity are encoded in a set of coefficients directly related to the parameters of the fundamental action. We expect our template to be relevant for modeled searches of an inspiralling signal in modified gravity.

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