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Love for an Expanding universe and SdS black holes

Love numbers of compact objects are a valuable tool in probing gravity at its strong field regime and testing for horizons using Gravitational waves. In this talk, we will discuss the definition of Love numbers for compact objects which are asymptotically deSitter. First, we shall discuss a way of defining Love numbers if the spacetime is not asymptotically flat and an appropriate definition for asymptotically deSitter compact objects. Following this, we will discuss the Love numbers for SdS black holes and obtain their values for the dominant mode of scalar perturbations on a small SdS black hole background up to $\mathcal{O}(H^2 M^2)$.

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