

Abstract for  
“Strong Equivalence Principle and Gravitational Wave Polarizations in Horndeski  
Theory”

The relative acceleration between two nearby particles moving along accelerated trajectories is studied, which generalizes the geodesic deviation equation. The polarization content of the gravitational wave in Horndeski theory is investigated by examining the relative acceleration between two self-gravitating particles. It is found out that the longitudinal polarization exists no matter whether the scalar field is massive or not. It would be still very difficult to detect the enhanced longitudinal polarization with the interferometer, as the violation of the strong equivalence principle of mirrors used by interferometers is extremely small. However, the pulsar timing array is promised relatively easily to detect the effect of the violation as neutron stars have large self-energy. The advantage of using this method to test the violation of the strong equivalence principle is that neutron stars are not required to be present in the binary systems.