



Contribution ID: 184

Type: not specified

Unitarization of infinite range forces, resonances in gravitational scattering of gravitons: The graviball

Friday 13 January 2023 16:50 (30 minutes)

We study graviton-graviton scattering in partial-wave amplitudes after unitarizing their Born terms. In order to apply S-matrix techniques, based on unitarity and analyticity, we introduce an S-matrix associated to this resummation that is free of infrared divergences. This is achieved by removing the diverging phase factor calculated by Weinberg that multiplies the S matrix, and that stems from the virtual infrared gravitons. A scalar graviton-graviton resonance with vacuum quantum numbers is obtained as a pole in the nonperturbative S-wave amplitude, which we call the graviball. Its resonant effects along the physical real-s axis may peak at values substantially lower than the UV cutoff squared of the theory. For some scenarios, this phenomenon could have phenomenological consequences at relatively low-energy scales, similarly to the σ resonance in QCD. To further illustrate this method we also consider Coulomb scattering, and compare with its known solution. References: 1.- D.Blas,J.Martín-Camalich,J.A.Oller, Phys.Lett.B827,136991(2022) 2.- D.Blas,J.Martín-Camalich,J.A.Oller,JHEP08,266(2022) 3.- J.A.Oller,arXiv:2207.08784[hep-th]

Presenter: OLLER, José Antonio (Universidad de Murcia)

Session Classification: 30' Contribution