

Faddeev Random Phase Approximation for Molecules

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The Faddeev Random Phase Approximation (FRPA) [1,2] is a Green's function method which couples collective degrees of freedom to the single particle motion by resumming an infinite number of Feynman diagrams. The Faddeev technique is applied to describe the two-particle-one-hole (2p1h) and two-hole-one-particle (2h1p) states in terms of Random Phase Approximation (RPA) phonons. This results in an equal treatment of the intermediary particle-particle (pp) and particle-hole (ph) channels. The poster will present the application of this method to molecules [3] and investigate the effects of adding fragmentation to the single particle propagator on the RPA instability arising in the dissociation limit.

[1] C. Barbieri and W. H. Dickhoff, Phys. Rev. C 63, 034313 (2001)

[2] C. Barbieri, D. Van Neck and W. H. Dickhoff, Phys. Rev. A 76, 052503 (2007)

[3] M. Degroote, D. Van Neck and C. Barbieri, Phys. Rev. A 83, 042517 (2011)