

Covariant Spectator Theory of nuclear forces

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I will review the Covariant Spectator Theory (CST) and discuss how it is applied to the covariant description of two and three nucleon systems. In practical applications we use a one boson exchange (OBE) approximation to the covariant kernel, originally justified by cancellations that arise in scalar field theories and now thought to be the leading approximation emerging from the large N_c limit of QCD. Recent high precision fits to np scattering data (up to 350 MeV) demonstrate, for the first time, that simple OBE models with only a few parameters are very successful, and that such models, which do not generate any three-body forces of relativistic origin, also explain the binding energy of the triton. The current conserving two and three body current operators of the CST will be given and first calculations of the three-nucleon form factors will be presented. Finally, some comparisons with nonrelativistic calculations will be made.