Nuclear Forces and Quark Degrees of Freedom

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Abstract

The description of the short-range part of the nucleon-nucleon forces in terms of quark degrees of freedom is tested against experimental observables. We consider, for this purpose, a model where the short-range part of the forces is given by the quark cluster model (QCM) and the long and medium range forces by well established meson exchanges. The investigation is performed using different QCM potentials coming from different sets of quark-quark interaction. The predictions of this model are compared not only with the phase shifts but also directly with the experimental observables. Agreement with the existing *pp* and *np* world set of data is poor. This suggests that the current description of the nucleon-nucleon interaction, at short distances, in the framework of the non relativistic quark models is only qualitative.