

Soft-core Baryon-baryon Interactions (*ESC-model at Low and Intermediate Energies*)

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Recent work with the Extended-Soft-Core (ESC) interactions is reviewed. The potentials of these BB -models consist of: (i) One-boson-exchange (OBE) potentials, with the standard pseudo-scalar-, vector-, and scalar-mesons. Novelties are the inclusion of the axial-vector mesons and a zero in the form factors of the scalar mesons. Also new is that for the first time the OBE-couplings and $F/(F+D)$ -ratios are constrained to be compatible with the predictions of the 3P_0 quark-pair creation (QPC) model. (ii) Two-pseudo-scalar-exchange (TPSE) potentials. (iii) Meson-pair-exchange (MPE) potentials, which are based on phenomenological baryon-baryon-meson-meson vertices. The motivation for including these MPE-potentials is that heavy boson couplings to the baryons, via decay into lighter mesons, leads to long and medium range potentials.

The ESC NN-model allows a clear cut extension to YN and YY, in contrast to the more phenomenological NN-models. The $SU(3)$ -extension of the ESC-model for NN to YN and YY is carried out by assigning the meson-pairs to the $SU(3)$ -irreps.

Fitting the ESC-models to the NN-data, using the 1993 Nijmegen single energy $pp + np$ phase shift analysis, leads to excellent results. We reached for the energies in the range $0 \leq T_{\text{lab}} \leq 350$ MeV, which comprises 4233 data, a $\chi^2_{\text{p.d.p.}} \approx 1.11$ -1.20. In this talk, we report on the application of the ESC-description of the NN-, YN- and YY-scattering data. In contrast to previous analyses, we performed a truly simultaneous fit to NN and YN. This improves for example the N P-waves.

It is discussed which features of the OBE-models are improved with ESC, but also the remaining problems are reviewed.

The strangeness -2 channels are predicted, without extra free parameters. The prediction for $B \approx 1.0$ MeV, which is close to the experimental value 1.0 ± 0.2 MeV from the Nagara-event. Also, some solutions show prospects for a rich Ξ -nucleus spectroscopy.

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The Colloquium will be given in English
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