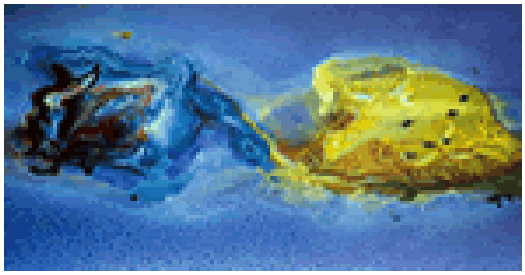

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Patterns in pion-exchange

Friday 3 August 2018 16:20 (20 minutes)

The potential between heavy hadrons due to pion-exchange can be obtained in the quark model (as a straightforward generalisation of the NN potential), or from heavy quark and chiral symmetries. The two approaches are shown to be fundamentally equivalent, and general results applicable to both are discussed. Expressions are derived for the pion-exchange potential between any constituents, combined in arbitrary spin and flavour channels. Although the existence or otherwise of molecular bound states depends on a poorly-constrained parameter, the pattern of which channels are most susceptible to binding is robust and generic, and can be readily understood in terms of the strength and sign of the long-range potential. In this sense the predictions of the molecular model are more tightly constrained by experimental data than the compact multiquark model, which generally predicts a large number of states in all possible spin and flavour channels.

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