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Isospin-breaking nucleon-nucleon interaction up to fifth order in chiral EFT

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Chiral EFT in the nucleon-nucleon (NN) sector has finally entered the precision era with a $\chi^2/\mathrm{datum} \sim 1$ description of NN scattering data for recent fifth order potentials. However, none of these potentials include a complete treatment of isospin-breaking effects. I present new NN potentials from chiral EFT with a complete inclusion of isospin-breaking effects up to fifth order, whose adjustable parameters have been fitted to the 2013 Granada database of NN scattering data. I give an overview of the parameter-free and adjustable IB contributions to the potential and discuss their impact on the two-nucleon system. The long-standing question regarding the charge-dependence of the one-pion exchange coupling constant will also be considered.

Primary author: Mr REINERT, Patrick (Ruhr-Universität Bochum)

Presenter: Mr REINERT, Patrick (Ruhr-Universität Bochum)

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