XVIII International Conference on Hadron Spectroscopy and Structure (HADRON2019)

Contribution ID: **167** Type: **Parallel**

Baryon-baryon scattering in manifestly Lorentz-invariant formulation of chiral perturbation theory

Tuesday, 20 August 2019 08:55 (20 minutes)

We study baryon-baryon scattering by applying time-ordered perturbation theory to the manifestly Lorentz-invariant formulation of chiral perturbation theory. The diagrammatic rules, for the first time, are worked out for the momentum-dependent interactions and propagators of particles with non-zero spin. We define the effective potential as a sum of two-baryon irreducible contributions of time-ordered diagrams and derive a system of integral equations for the scattering amplitude, which provides a coupled-channel generalization of the Kadyshevsky equation. The obtained leading-order baryon-baryon potentials are perturbatively renormalizable, and the corresponding integral equations have unique solutions in all partial waves. We also discuss the issue of additional finite subtractions required, e.g., in the $^3P_0$ partial waves to improve the ultraviolet convergence of (finite) loop integrals on the nucleon-nucleon and hyperon-nucleon scatterings.

V.Baru, E.Epelbaum, J. Gegelia, X.-L. Ren, arXiv:1905.02116

Primary author: Dr REN, Xiu-Lei (Ruhr-University Bochum)

Co-authors: Prof. EPELBAUM, Evgeny (Ruhr-University Bochum); Dr GEGELIA, Jambul (Ruhr-Universitaet Bochum); Dr BARU, Vadim (Bonn University, HISKP)

Presenter: Dr REN, Xiu-Lei (Ruhr-University Bochum)

Session Classification: Session 4: Hadron decays, production and interactions

Track Classification: Session 4: Hadron decays, production and interactions