Contribution ID: **84** Type: **not specified**

On finite volume effects in the chiral extrapolation of baryon masses

Tuesday, 16 September 2014 11:00 (30 minutes)

We perform an analysis of the QCD lattice data on the baryon octet and decuplet masses based on the relativistic
chiral Lagrangian. The baryon self energies are computed in a finite volume at next-to-next-to-next-to leading order (N^{3}LO), where the dependence on the physical meson and baryon masses is kept.
The number of free parameters
is reduced significantly down to 12 by relying on large-N_c sum rules.
Altogether we describe accurately more than 220 data points from six different lattice groups, BMW, PACS-CS, HSC, LHPC,
QCDSF-UKQCD and NPLQCD. Values for all counter terms relevant at N^{3}LO are predicted.
In partic\-ular we extract a pion-nucleon sigma term of 39^{+2}_{-1} MeV and a strangeness sigma term of the nucleon of
$\sigma_{sN} = 84^{+28}_{-4}$ MeV. The flavour SU(3) chiral limit of the baryon octet and decuplet masses is determined with (802 ± 4) MeV and (1103 ± 6) MeV. Detailed predictions for the baryon masses as currently evaluated by the ETM lattice QCD group are made

Primary author: Prof. LUTZ, Matthias F.M. (GSI)

Presenter: Prof. LUTZ, Matthias F.M. (GSI)