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Light quark mass dependence of nucleon mass to two-loop order

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We investigate the nucleon self energy through the sixth chiral order in the covariant SU(2) chiral perturbation theory (χPT) in the single baryon sector using the extended-mass-on-shell(EOMS) scheme. It is found that the EOMS scheme exhibits quite satisfactory convergence behavior through O(q^6) around physical point. We also predict the pion mass dependence of the nucleon mass to the accuracy of O(q^6), which is in satisfactory agreement with the recent lattice results over a wide range of pion mass.

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