Consistent chiral-EFT improved M1 operators for ab initio calculations[1] SHIPLU SARKER, SOHAM PAL, ROBERT BASILI, PIETER MARIS, JAMES P. VARY, Iowa State University, PATRICK J. FASANO, MARK A. CAPRIO, University of Notre Dame — Over the past two decades chiral Effective Field Theory (χEFT) has been successfully applied to model the internucleon interaction, such as the LENPIC interactions, and nuclear electroweak currents to study few nucleon systems. Here we construct the effective M1 operator up to N3LO in a harmonic oscillator (HO) basis consistent with the LENPIC interaction from one-body and two-body χEFT electromagnetic current operators, and apply that to light nuclei within the framework of the no-core shell model (NCSM). We present preliminary results for the deuteron, 3H and 3He magnetic moments, and study their convergence at each chiral order as function of the basis expansion. We also estimate the chiral truncation uncertainties of these magnetic moments and discuss the role of the χEFT regulator.

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