

Abstract Submitted  
for the DNP19 Meeting of  
The American Physical Society

**Baryon self-energies in relativistic chiral SU(3) effective theory**

MARSTON COPELAND, Department of Physics and Astronomy, Clemson University, Clemson, SC 29634, USA, CHUENG-RYONG JI, Department of Physics, North Carolina State University, Raleigh, North Carolina 27695, USA, WALLY MELNITCHOUK, Jefferson Lab, Newport News, Virginia 23606, USA — We calculate the self-energies of the flavor SU(3) octet and decuplet baryons, using a relativistic chiral effective theory framework consistent with Lorentz and gauge invariance. The results are compared using several different regularization prescriptions, including finite-range regularization, Pauli-Villars, and dimensional regularization, which are shown to yield the same leading nonanalytic behaviors in the chiral limit, as expected in QCD. Using the same chiral effective theory framework, we also compute the pseudoscalar meson loop contributions to flavor asymmetries in parton distributions, such as the  $\bar{d} - \bar{u}$  and  $s - \bar{s}$  quark asymmetries in the proton.

Marston Copeland  
Clemson University

Date submitted: 30 Jun 2019

Electronic form version 1.4