Abstract Submitted
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Dipole strength from first principles calculations[1] MIRKO MIORELLI, SONIA BACCA, TRIUMF, Vancouver, BC, Canada, NIR BARNEA, Racah Institute of Physics, Hebrew University, Jerusalem, GAUTE HAGEN, GUSTAV R. JANSEN, THOMAS PAPENBROCK, Oak Ridge National Laboratory, Oak Ridge, TN, USA, GIUSEPPINA ORLANDINI, Dipartimento di Fisica, Universit di Trento, Trento, Italy — The electric dipole polarizability quantifies the low-energy behavior of the dipole strength. It is related to the proton and neutron distributions of the nucleus, and thereby can be used to constrain the neutron equation of state and the physics of neutron stars. Only recently however, new developments in *ab initio* methods finally allowed first principles studies of the dipole strength in medium-mass nuclei [1,2]. Using the Lorentz integral transform coupled cluster method with the newly developed chiral interaction $\mathrm{NNLO_{sat}}$ we study the low energy behavior of the dipole strength in ^{4}He, ^{16}O and ^{22}O [2]. For the exotic ^{22}O we observe large contributions to the dipole strength at very low energy, indicating the presence of a pygmy dipole resonance, in agreement with what experimentally found by Leistenschneider *et al.* [3]. We then study correlations between the electric dipole polarizability and the charge radius in ^{16}O and ^{40}Ca using a variety of realistic Hamiltonians, showing the importance of three-nucleon forces [2]. [1] S. Bacca *et al.*, Phys. Rev. C 90, 064619 (2014) [2] M. Miorelli *et al.*, arXiv:1604.05381 (2016) [3] A. Leistenschneider *et al.*, Phys. Rev. Lett. 86, 5442-5445 (2001)

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Mirko Miorelli
TRIUMF, Vancouver, BC, Canada

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