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Coupled-cluster theory computation of the nuclear electric dipole polarizability SONIA BACCA, MIRKO MIORELLI, TRIUMF, 4004 Wesbrook Mall, Vancouver, BC V6T 2A3, Canada, NIR BARNEA, Racah Institute of Physics, The Hebrew University, Jerusalem 91904, Israel, GAUTE HAGEN, Physics Division, Oak Ridge National Laboratory,Oak Ridge, Tennessee 37831, USA, GIUSEPPINA ORLANDINI, Dept. di Fisica, Università di Trento and Istituto Nazionale di Fisica Nucleare and Gruppo Collegato di Trento, I-38123 Trento, Italy, THOMAS PAPENBROCK, Dept. of Physics and Astronomy, University of Tennessee, Knoxville, Tennessee 37996, USA — The electric dipole polarizability α_D is strongly correlated with the size of atomic nuclei. It informs us about the neutron equation of state and links atomic nuclei to neutron stars. In recent years, scattering experiments have been used to determine the dipole polarizability in ^{208}Pb [1], ^{120}Sn [2] and ^{68}Ni [3]. Combining the Lorentz integral transform with the coupled-cluster method allows us to perform ab initio computations of α_D for medium mass nuclei [4,5]. In Ref. [6] we predicted the polarizability for ^{48}Ca and presently we are investigating heavier systems such as ^{68}Ni and ^{90}Zn. [1] A. Tamii et al., Phys. Rev. Lett. 107, 062502 (2011). [2] T. Hashimoto et al., Phys. Rev. C 92 031305 (2015). [3] D.M. Rossi, et al., Phys. Rev. Lett. 111, 242503 (2013). [4] S. Bacca, N. Barnea, G. Hagen, M. Miorelli, G. Orlandini and T. Papenbrock, Phys. Rev. C 90, 064619 (2014). [5] M. Miorelli, S. Bacca, N. Barnea, G. Hagen, G. Orlandini and T. Papenbrock, in preparation. [6] G. Hagen, et al., Nature Physics, 3529 (2015).

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