Abstract Submitted
for the APR21 Meeting of
The American Physical Society

Pauli energy contribution to nucleus-nucleus interaction potentials[1] SAIT UMAR, Department of Physics and Astronomy, Vanderbilt University, Nashville, Tennessee 37235, USA, KYLE GODBEY, Cyclotron Institute, Texas A&M University, College Station, TX 77843, USA, CEDRIC SIMENEL, Department of Theoretical Physics and Department of Nuclear Physics, Research School of Physics, The Australian National University, Canberra ACT 260 — In this work we use the nucleon localization function (NLF) approach [1] to demonstrate the contribution of Pauli energy to nucleus-nucleus interaction potentials. This is a follow up on our previous work on assessing the Pauli effect on the formation of potential pockets in ion-ion interaction potentials [2]. Calculations are done using the density-constrained frozen density approach (DCFHF), the dynamical time-dependent density-constrained Hartree-Fock (DC-TDHF) method, as well as the full time-dependent Hartree-Fock (TDHF) method. We also utilize the Pauli localization function (PLF) to better visualize these effects. [1] T. Li, M. Z. Chen, C. L. Zhang, W. Nazarewicz, and M. Kortelainen, Nucleon localization function in rotating nuclei, Phys. Rev. C 102, 044305 (2020). [2] C. Simenel, A. S. Umar, K. Godbey, M. Dasgupta, and D. J. Hinde, How the Pauli exclusion principle affects fusion of atomic nuclei, Phys. Rev. C 95, 031601 (2017).

[1]This work has been supported by the U.S. Department of Energy under grant No. DE-SC0013847 with Vanderbilt University and by the NNSA Cooperative Agree- ment DE-NA0003841, and by the Australian Research Coun- cils Grant No. DP190100256.

Sait Umar
Vanderbilt Univ

Date submitted: 05 Jan 2021 Electronic form version 1.4