

Abstract Submitted  
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**Multiferroicity in HoFeO<sub>3</sub>** PRATIK DHUVAD, XIFAN WU, Physics Department, Temple University, Philadelphia, PA 19122 — Rare-earth ferrites are becoming popular among multiferroic materials due to its spontaneous magnetic and electric orderings. After discovery of new family of multiferroic RFeO<sub>3</sub>(R=Lu)<sup>1</sup>(LFO) which shows simultaneous ferroelectricity and weak ferromagnetic moment, HoFeO<sub>3</sub>(HFO) is explored as a potential candidate in multiferroic materials. Combined theoretical and experimental study has been done to understand ferroelectric and ferromagnetic properties of HFO. Our calculations suggest that iron in HFO exhibits very large canting, about one order of magnitude, compared to canting of iron in LFO, which is consistent with experimental findings. Analysis of structural phase transitions and calculation of phonon modes governing this ferroelectric transition revealed that HFO is improper ferroelectric with ferroelectric polarization about 8.3  $\mu\text{C}/(\text{cm}^2)$ . These ferroic properties advocate HFO to be a useful multiferroic among other rare-earth ferrites.

<sup>1</sup>H Wang et al, Phys. Rev. B 90, 014436 (2014)

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