Searches for possible T-odd and P-odd short range interactions using polarized nuclei RAKSHYA KHATIWADA, Indiana University, PING-HAN CHU, Duke University, ALEC DENNIS, Indiana University, CHANGBO FU, Shanghai Jiaotong University, HAIYAN GAO, GEORGIOS LASKARIS, Duke University, KE LI, ERICK SMITH, WILLIAM SNOW, HAIYANG YAN, Indiana University, WANGZHI ZHENG, Duke University — Various theories predict the possible existence of T-odd and P-odd short-range forces between spin-1/2 fermions, proportional to $\mathbf{S} \cdot \mathbf{r}$ where $\mathbf{S}$ is the fermion spin and $\mathbf{r}$ is the separation between particles. We use ensembles of polarized nuclei and an unpolarized mass to search for such a force over sub-mm ranges. We established an improved upper bound on the product $g_s g_p^n$ of the scalar coupling to particles in the unpolarized mass and the pseudo-scalar coupling of polarized neutrons for force ranges from 10^{-4} to 10^{-2} m, corresponding to a mass range of $2 \cdot 10^{-3}$ to $2 \cdot 10^{-5}$ eV for the exchange boson.

Rakshya Khatiwada
Indiana University