Investigation of Broken Time Reversal Symmetry in Pr-concentrated side of Pr$_{1-x}$Nd$_x$Os$_4$Sb$_{12}$. P.-C. HO, CSU-Fresno, D. E. MACLAUGHLIN, UC Riverside, M. B. MAPLE, UC San Diego, L. SHU, Fudan U, China, O. O. BERNAL, CSU-Los Angeles, A. D. HILLIER, ISIS/STFC, Harwell, UK, T. YANAGISAWA, Hokkaido U, Japan — One of the intriguing features that indicate unconventional superconductivity (SC) in the filled skutterudite compound PrOs$_4$Sb$_{12}$ is the broken time reversal symmetry (TRS)[1]. Previously in our muon spin relaxation ($\mu$SR) study on the influence of the Nd$^{3+}$ moment in Pr$_{1-x}$Nd$_x$Os$_4$Sb$_{12}$[2], we found that the magnetism extends deep in the SC state for $0.45 \leq x \leq 0.55$ and a strong $\mu^+$ dynamic rate in $x = 0.25$ possibly resulting from significant Nd moment fluctuations. In our most-recent results of $\mu$SR experiments in the x=0.05 and 0.1 samples, at zero magnetic field, a combined exponential and Gaussian relaxation behavior was found. The exponential rate has a strong temperature dependence below $T_c$, which may originate from spontaneous supercurrents or spin texture due to broken TRS. [1] Y. Aoki et al., PRL 91, 067003 (2003). [2] D. E. MacLaughlin et al., PRB 89, 144419 (2014).

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Pei-Chun Ho
CSU-Fresno

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