Time Reversal Symmetry of A and B phases of PrOs$_4$Sb$_{12}$

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The heavy-fermion superconductor PrOs$_4$Sb$_{12}$ has attracted great interest because of the existence of two superconducting transitions at zero magnetic field. However, there is great debate over whether the two superconducting phases (A and B) corresponding to these transitions are intrinsic or simply the result of impurity-induced inhomogeneities. Further, there is strong evidence for time reversal symmetry breaking (TRSB) in the superconducting state. We present polar Kerr effect measurements of PrOs$_4$Sb$_{12}$ crystals. By moving the focused optical spot over the surface of our samples, we are able to discern whether the strength and onset temperature of TRSB is homogeneous over the entire crystal.

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