Abstract Submitted
for the MAR06 Meeting of
The American Physical Society

**Spin-triplet pairing in noncentrosymmetric superconductors: $Li_2Pd_3B$ and $Li_2Pt_3B$** H.Q. YUAN, M.B. SALAMON, D. VANDERVELDE, Department of Physics, University of Illinois at Urbana and Champaign, D.F. AGTERBERG, Department of Physics, U. Wisconsin-Milwaukee, N. HAYASHI, M. SIGRIST, Theoretische Phyik, ETHZ, P. BADICA, Institute for Materials Research, Tohoku University, K. TOGANO, NIMS, Japan — Superconductors lacking inversion symmetry exhibit qualitatively distinct properties from those with an inversion center. In this presentation, we report strong evidence for triplet superconductivity caused solely by the absence of parity symmetry in two closely related cubic compounds $Li_2Pd_3B$ and $Li_2Pt_3B$. Broken inversion symmetry admits antisymmetric spin-orbit coupling, admixing spin-singlet and spin-triplet pairing even with s-wave orbital symmetry. The triplet contribution is weak in $Li_2Pd_3B$, a BCS-like superconductor with an anisotropic gap. With increased spin- orbit coupling the spin-triplet component dominates in $Li_2Pt_3B$, producing line nodes in the energy gap. Results are supported by the quantitative agreement between experimental penetration depth data and theory. Our findings demonstrate that unconventional superconducting properties can originate from a conventional phonon pairing mechanism rather than requiring purely electronic coupling mechanisms as usually considered.

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Date submitted: 29 Nov 2005 Electronic form version 1.4