The magnetic and superconducting phase diagram of PrFeAsF$_{x}$O$_{1-x}$

COSTEL R. ROTUNDU, STEPHEN D. WILSON, Materials Sciences Division, Lawrence Berkeley National Laboratory, Berkeley, CA 94720, USA, BYRON K. FREELON, Department of Physics, University of California, Berkeley, CA 94720, USA, EDITH BOURRET-COURCHESNE, Materials Sciences Division, Lawrence Berkeley National Laboratory, Berkeley, CA 94720, USA, ROBERT J. BIRGENEAU, Department of Physics, University of California, Materials Sciences Division, Lawrence Berkeley National Laboratory, Berkeley, CA 94720, USA — The electronic phase diagram of the newly discovered iron pnictide superconductors RFeAsO$_{1-x}$F$_{x}$ (R=rare-earth) is of great interest and with implications in the understanding of the nature of superconductivity (SC) itself. Predicted by ab initio calculations [1] and pointed by resistivity measurements [2], the relevance of a quantum critical point remains controversial in the light of the structural phase transition between the magnetic SDW and SC [3]. We present a detailed magnetic and superconducting phase diagram of PrFeAsO$_{1-x}$F$_{x}$ as inferred from magnetic susceptibility and resistivity measurements. References: [1] G. Giovannetti et al., Physica B 403, 3653 (2008) [2] R. H. Liu et al., Phys Rev Lett 101, 087001 (2008) [3] H. Luetkens et al., cond.mat:0806.3533

1Support for work at LBNL is provided through the Office of Basic Energy Sciences US DOE DE-AC03-76SF008

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Date submitted: 15 Dec 2008

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