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Magnetoresistance Near the Quantum Critical Point of $\text{BaFe}_2(\text{As}_{1-x}\text{P}_x)_2$ IAN HAYES, Department of Physics, University of California, Berkeley, California 94720, ARKADY SHEKHTER, ROSS MCDONALD, National High Magnetic Field Laboratory, Los Alamos National Laboratory, Los Alamos NM 87545, NICHOLAS BREZNAY, Materials Science Division, Lawrence Berkeley National Laboratory, California 94720, JAMES ANALYTIS, Department of Physics, University of California, Berkeley, California 94720 — We report on the magnetoresistance of the Iron-pnictide superconductor $\text{BaFe}_2(\text{As}_{1-x}\text{P}_x)_2$ up to 65 Tesla. In addition to showing unconventional superconductivity, this compound has a quantum critical point associated with the suppression of the anti-ferromagnetic transition to zero temperature at a $x = 0.33$. We propose a simple model for the magnetoresistance of a quantum critical system; at the quantum critical point of $\text{BaFe}_2(\text{As}_{1-x}\text{P}_x)_2$ this model captures the data quite well, while significant deviations are observed for samples far from the critical point. I will discuss this analysis in detail, as well as extensions to other systems.

Ian Hayes
Department of Physics, University of California, Berkeley

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