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**Quantum critical fluctuations in the itinerant antiferromagnet $Nb_{12}O_{29}$** JINGUANG CHENG, JIANSHI ZHOU, JOHN GOODENOUGH, TMI, University of Texas at Austin, HAIDONG ZHOU, NHMFL, Florida State University — Monoclinic $Nb_{12}O_{29}$ is a metallic antiferromagnet with $T_N \approx$12 K. [1] We have studied critical behaviors near $T_N$ by measuring the resistivity ($\rho$), specific heat ($C_p$), and thermoelectric power (S). As $T_N$ is approached from $T_N^+$, critical behaviors used in ferromagnetic metals, $d\rho/dT = (a^+/\alpha)|t|^{-\alpha} + b^+ + c^+t$ and $C_p = (A^+/\alpha)|t|^{-\alpha} + B^+ + C^+t$ provide the best description for $d\rho/dT$ and $C_p$, respectively. We found an identical $\alpha \approx 0.2(2)$ in both $d\rho/dT$ and $C_p$, as predicted by Fisher and Langer in a ferromagnetic metal. [2] These observations indicate strong critical scattering of conduction electrons by short-range spin fluctuations near $T_N$. In addition, the S is strongly enhanced at low temperatures. The temperature dependence of S above $T_N$ follows closely the formula $S/T \propto -\ln T$, which suggests that quantum critical fluctuations [3] plays a role in enhancing the thermoelectric power on top of the classic critical fluctuations.

[1] R. J. Cava, *et al.*, Phys. Rev. B **44**, 6973 (1991).
[2] M. E. Fisher and J. S. Langer, Phys. Rev. Lett. **20**, 665 (1968).
[3] I. Paul and G. Kotliar, Phys. Rev. B **64**, 184414 (2001).

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