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Optical signature of the Quantum Critical Point in electron doped cuprates[1] R.P.S.M. LOBO, N. BONTEMPS, ESPCI - CNRS, A. ZIMMERS, M.C. BARR, Y. DAGAN, R.L. GREENE, CSR, Department of Physics, University of Maryland, C.C. HOMES, Department of Physics, Brookhaven National Laboratory, New York, A.J. MILLIS, Physics Department, Columbia University, New York — We measured the temperature dependence of the optical conductivity of $(Pr,Ce)_2CuO_4$ films from the very underdoped to the overdoped regime between 4 meV and 3 eV. We observed a normal state gap but the presence of a Drude-like peak indicates that this gap is partial. The temperature at which the partial gap opens decreases with increasing Ce content and the gap disappears in the overdoped sample. Our data is consistent with a commensurate spin density wave with a (π, π) wavevector. When the spin density wave is taken into account, the phase diagram of electron doped cuprates shows a quantum critical point inside the superconducting dome at a Ce concentration around 0.17 in agreement with evidence for a QCP from dc transport experiments [Dagan *et al.*, PRL **92**, 167001 (2004)].

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