Abstract Submitted
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Quantum Fluctuation of the Order Parameter in a Structural Phase Transition[1] JAMES L. SMITH, Los Alamos Nat'l Lab, S.M. SHAPIRO, Brookhaven Nat'l Lab, K.A. MODIC, J.C. COOLEY, Los Alamos Nat'l Lab, E.K.H. SALJE, P.B. LITTLEWOOD, Cambridge University, C.P. OPEIL, Boston College, J.C. LASHLEY, Los Alamos Nat'l Lab — Using a variety of microscopic and bulk-thermodynamic probes (e.g., elastic neutron scattering, inelastic x-ray scattering, specific heat, and pressure-dependent electrical transport), we provide evidence for the presence of a continuous martensitic transition in the binary AuZn system. In $Au_{0.52}Zn_{0.48}$ and AuZn, elastic neutron scattering detects new commensurate Bragg peaks (modulation) appearing at Q = (1.33, 0.67, 0) at temperatures corresponding to each sample's martensitic transition temperature, T_M. The pressure dependence of the transition in each alloy, shows a low-temperature saturation of the order parameter (strain-shuffle) that leads to highly non-linear phase boundaries in temperature-pressure space and to superconductivity in the case of $Au_{0.52}Zn_{0.48}$.

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