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**Fano resonance and the hidden order in URu<sub>2</sub>Si<sub>2</sub> probed by quasiparticle scattering spectroscopy\*** W. K. PARK, L. H. GREENE, Univ. of Ill. at Urbana-Champaign, E. D. BAUER, P. H. TOBASH, F. RONNING, X. LU, J. L. SARRAO, J. D. THOMPSON, Los Alamos Nat. Lab. — The nature of the hidden order transition occurring at 17.5 K in URu<sub>2</sub>Si<sub>2</sub> remains puzzling despite intensive investigations over the past two and half decades. Recent experimental and theoretical developments render it a timely subject to probe the hidden order state using quasiparticle tunneling and scattering techniques. We report on the Fano resonance in pure and Rh-doped URu<sub>2</sub>Si<sub>2</sub> single crystals using point-contact spectroscopy. The conductance spectra reproducibly reveal asymmetric double peak structures slightly off-centered around zero bias with the two peaks merging well above the hidden order transition temperature. An analysis using the Fano resonance model in a Kondo lattice [1] shows that the conductance peaks arise from the hybridization gap opening. Our estimated gap size agrees well with those reported from other measurements. We will present experimental results over a wide parameter space including temperature and doping dependences and discuss their underlying physics. [1] M. Maltseva, M. Dzero, and P. Coleman, Phys. Rev. Lett. **103**, 206402 (2009). \*The work at UIUC is supported by the U.S. DOE under Award Nos. DE-FG02-07ER46453 and DE-AC02-98CH10886, and the work at LANL is carried out under the auspices of the U.S. DOE, Office of Science.

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