

Abstract Submitted
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**The Hidden Order Gap and In-Gap Excitation Mode in URu₂Si₂
Revealed by Electronic Raman Scattering¹**

HSIANG-HSI KUNG, Rutgers University, RYAN BAUMBACH, ERIC BAUER, Los Alamos National Laboratory, JOHN A. MYDOSH, Kamerlingh Onnes Laboratory, WEILU ZHANG, VERNER K. THORSMØLLE, KRISTJAN HAULE, GIRSH BLUMBERG, Rutgers University — The heavy fermion compound URu₂Si₂ displays a phase transition into the so called “hidden order” state at $T_{HO} = 17.5$ K. Using polarized electronic Raman scattering, we show that the Raman response in the A_{2g} symmetry channel (D_{4h}): (1) at high temperatures can be described by a Drude-like continuum with the scattering rate decreasing from 46 cm^{-1} at 300 K to 16 cm^{-1} at 70 K; (2) develops a low energy peak due to spectral weight transfer through Fano interference in the temperature range of 70-20 K; (3) below T_{HO} develops a gap of about 55 cm^{-1} in the continuum, and a sharp in-gap mode centered at 14 cm^{-1} . In addition, we show that the real part of the static Raman susceptibility in the A_{2g} symmetry is proportional to the c -axis static magnetic susceptibility above T_{HO} . The implication of these observations will be discussed in the talk.

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