

Abstract Submitted  
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**Precursor Hidden Order Fluctuations in URu<sub>2</sub>Si<sub>2</sub>**<sup>1</sup> PETER RISEBOROUGH, Physics Department, Temple University — It has been proposed that the Hidden Order phase in URu<sub>2</sub>Si<sub>2</sub> is a combined spin-orbit density wave, which is stabilized by the effect of the spin-flip part of the inter-orbital Hund's rule exchange. The transition involved the nesting of bands with different orbital characters and results in a partial gapping of the Fermi-surface. Above the transition temperature, the system exhibits combined spin and orbital fluctuations whose lifetimes and amplitudes increase as the temperature is reduced towards the critical temperature. These fluctuations produces hot-spots on the Fermi-surface, modifies the electronic structures as precursor to the opening of the gap. We examine the dependence of precritical fluctuations on the transition temperature. As the critical temperature is reduced to zero, it is found that the nature of the transition changes from second-order to first-order.

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