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A Γ_5 composite density wave model for the hidden order of URu_2Si_2 ¹ PIERS COLEMAN, PREMALA CHANDRA, Rutgers University, REBECCA FLINT, Massachusetts Institute of Technology — Motivated by recent experiments on URu_2Si_2 [1-4], we propose a theory for the hidden order in this material in which the hidden order parameter is a composite density wave formed between conduction electrons and a Γ_5 $5f^2$ doublet. In this theory, two-channel quadrupole fluctuations in the Γ_5 proceed via virtual fluctuations into a $5f^1$ Kramer's doublet with Γ_7 symmetry. Hybridization in these two channels is described by a Schwinger boson which condenses in both the hidden order and the magnetic phase. In the magnetic phase, the hybridization develops in the up or down channels, whereas in the hidden order phase, it develops with equal amplitude in both channels. Our theory can account for the development of an anomalous $\Delta\chi_{xy}$ as a consequence of the composite order. It also predicts the formation of a tiny orbital moment aligned along the xy axis in the basal plane of the crystal that should be observable in neutron scattering experiments.

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