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Non-Fermi surface nesting driven commensurate magnetic ordering in Fe-doped Sr_2RuO_4. M. ZHU, Michigan State University, K.V. SHANAVAS, University of Missouri, Y. WANG, Tulane University, T. ZOU, Michigan State University, W.F. SUN, Tulane University, W. TIAN, V.O. GARLEA, A. PODLESNYAK, M. MATSUDA, M.B. STONE, Oak Ridge National Laboratory, D. KEAVNEY, Argonne National Laboratory, Z.Q. MAO, Tulane University, D.J. SINGH, University of Missouri, X. KE, Michigan State University — Sr_2RuO_4, an unconventional superconductor, is known to possess an incommensurate spin density wave instability driven by Fermi surface nesting. Here we report a new static spin density wave ordering with a commensurate propagation vector $\mathbf{q}_c = (0.25\ 0.25\ 0)$ in Fe-doped Sr_2RuO_4, despite that the magnetic fluctuations still persist at the incommensurate wave vectors $\mathbf{q}_{ic} = (0.3\ 0.3\ L)$. First principles calculations show that Fe substitution barely changes the nesting vector of the Fermi surface, but leads to antiferromagnetic polarization in the nearest-neighbor Ru magnetic moments. Our results imply that in addition to the known incommensurate magnetic instability, Sr_2RuO_4 is also in proximity to a commensurate magnetic tendency that can be stabilized via tuning the local exchange interaction between Ru and dilute magnetic impurities.

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