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Direct Observation of a Superconducting Spin Resonance in the Heavy Fermion Antiferromagnetic Superconductor UNi_2Al_3[1] JEROD WAGMAN, JONATHAN GAUDET, McMaster University, COLLIN BROHOLM, JOSE RODRIGUEZ, National Institute of Standards and Technology, BARRY WINN, MELISSA GRAVES-BROOK, Oak Ridge National Laboratory, JIM GARRETT, Brockhouse Institute for Materials Research, BRUCE GAULIN, McMaster University — We present neutron scattering data identifying a superconducting spin resonance in the heavy fermion, antiferromagnetic superconductor UNi_2Al_3. This resolves a longstanding issue in the comparison of UNi_2Al_3 to its isostructural sister UPd_2Al_3. Theses material both undergo antiferromagnetic phase transitions at relatively high temperatures, $T_N = 4.6$ K and 14.5 K respectively, before respectively superconducting below 1.2 and 2 K(B. D. Gaulin, et al, PRB 66, 174520 (2002)). However, previous reports suggest that only the magnetic fluctuations in UPd_2Al_3 display sensitivity to superconductivity via a superconducting spin resonance - the build up in the superconducting ground state of excess scattered intensity at a well defined resonance energy centered on a magnetic wave-vector. We resolve this disparity by clearly identifying a superconducting spin resonance in UNi_2Al_3 at the incommensurate wavevector $Q = (\frac{1}{2} \pm 0.11\ 0\ \frac{1}{2})$. This re-establishes the relationship between these sister compounds and further evidences the intimate correlation of magnetism and superconductivity.

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