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**Observation of the p-wave contact** C. LUCIUK, S. SMALE, S. TROTZKY, N. ZUBER, University of Toronto, SHIZHONG ZHANG, University of Hong Kong, J.H. THYWISSEN, University of Toronto — The contact, i.e. the normalization of the many-body wave function at short range, has been studied extensively for s-wave interactions. It is well understood that the functional form of the contact describes universal thermodynamics near a broad s-wave scattering resonance. Here we present the first measurements of the contact for a system with near-resonant p-wave interactions. We tune a spin-polarized degenerate Fermi gas of $^{40}$K using the p-wave Fano-Feshbach resonances near 199 G. Time-resolved radio-frequency (rf) spectroscopy enables us to study the gas even though it decays within a millisecond. We observe that near either p-wave resonance, the spin-flip rate to a weakly interacting probe state scales as $\delta^{-1/2}$ for large positive $\delta$, where $\delta$ is the detuning from the single-particle transition. Such a scaling is equivalent to a $1/k^2$ scaling of the momentum distribution, as opposed to the $1/k^4$ scaling of the pair wave function for s-waves, where $k$ is relative momentum.

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