

Abstract Submitted
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Two-Element Mixture of Bose and Fermi Superfluids¹ RICHARD ROY, ALAINA GREEN, RYAN BOWLER, SUBHADEEP GUPTA, Department of Physics, University of Washington, UW ULTRACOLD MIXTURES TEAM — We report on the production of a stable mixture of bosonic and fermionic superfluids composed of the elements ^{174}Yb and ^6Li which feature a strong mismatch in mass and distinct electronic properties. We demonstrate elastic coupling between the superfluids by observing the shift in dipole oscillation frequency of the bosonic component due to the presence of the fermions. The measured magnitude of the shift is consistent with a mean-field model and its direction determines the previously unknown sign of the interspecies scattering length to be positive. We also observe the exchange of angular momentum between the superfluids from the excitation of a scissors mode in the bosonic component through interspecies interactions. We explain this observation using an analytical model based on superfluid hydrodynamics.

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Richard Roy
Department of Physics, University of Washington

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