

Resonantly interacting lithium-chromium Fermi mixtures

Sunday, 10 September 2023 22:40 (20 minutes)

Resonantly interacting mixtures of ultracold fermionic atoms provide versatile and highly controllable platforms with which to explore a wealth of phenomena occurring in strongly-correlated systems: from helium liquids and solid-state materials, up to nuclear and quark matter. Here, I will discuss recent progress of my experimental team in making, probing and characterizing novel 6Li - 53Cr ultracold Fermi mixtures under resonantly-interacting conditions: From the efficient production of highly-degenerate lithium and chromium Fermi gases [1,2] and the thorough characterization of the interspecies scattering properties [3], to the most recent studies of collective oscillations of resonantly-interacting mixtures, and the realization of high phase-space density Bose gases of LiCr Feshbach molecules.

[1] Neri E., Ciamei A., Simonelli C., Goti I., Inguscio M., Trenkwalder A. and Zaccanti M., Phys. Rev. A, 101, 063602 (2020).

[2] Ciamei A., Finelli S., Cosco A., Inguscio M., Trenkwalder A. and Zaccanti M., Phys. Rev. A, 106, 053318 (2022).

[3] Ciamei A., Finelli S., Trenkwalder A., Inguscio M., Simoni A. and Zaccanti M., Phys. Rev. Lett., 129, 093402 (2022).

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Session Classification: Poster Session I

Track Classification: Other