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**Precision Spectroscopy of an Interacting Ytterbium Fermi-Fermi Mixture** BENJAMIN ABELN, MARCEL DIEM, KOEN SPONSELEE, NEJIRA PINTUL, KLAUS SENGSTOCK, CHRISTOPH BECKER, University of Hamburg — We study an ultracold interacting Fermi-Fermi mixture of  $^{171}\text{Yb}$  and  $^{173}\text{Yb}$ . The Yb Fermi-Fermi mixture in the ground state is characterized by strongly attractive inter-species interactions, while the intra-species interactions are vanishing for  $^{171}\text{Yb}$  and repulsive for  $^{173}\text{Yb}$ . Performing precision spectroscopy on the  $^1\text{S}_0$  to  $^3\text{P}_0$  clock transition we find and characterize a  $\text{SU}(2) \times \text{SU}(6)$  symmetric interspecies interorbital interaction. We discuss prospects of spectroscopic methods to gain information on the many-body state of the system.

Benjamin Abeln  
University of Hamburg

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