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A strongly interacting Fermi gas of ytterbium-173 in low dimensions NELSON DARKWAH OPPONG, LUIS RIEGGER, OSCAR BETTERMANN, MORITZ HOEFER, IMMANUEL BLOCH, SIMON FOELLING, LMU, Munich, Germany; MPQ, Garching, Germany — Fermionic ytterbium as an alkaline-earth-like atom features a metastable excited state. The so-called clock state opens up the possibility of exploring interacting two-orbital many-body systems. The strong interorbital spin-exchange interaction of ytterbium-173 leads to a novel type of Feshbach resonance due to the orbital and nuclear spin degree of freedom. This recently observed orbital Feshbach resonance allows to tune the interaction strength in an external magnetic field. In our experiment, a strongly interacting two-orbital Fermi gas of ytterbium-173 is prepared in quasi-2D using a state-independent optical lattice. In addition to the magnetic field, the properties of the interacting system are modified by strong confinement. We probe the effect of reduced dimensions onto the strongly interacting two-orbital Fermi gas with high-resolution spectroscopy on the clock transition.

Nelson Darkwah Oppong
LMU, Munich, Germany; MPQ, Garching, Germany

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