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Hydrodynamics of a unitary Bose gas JAY MAN, RICHARD FLETCHER, RAPHAEL LOPES, NIR NAVON, ROB SMITH, ZORAN HADZIBABIC, Univ of Cambridge — In general, normal-phase Bose gases are well described by modelling them as ideal gases. In particular, hydrodynamic flow is usually not observed in the expansion dynamics of normal gases, and is more readily observable in Bose-condensed gases. However, by preparing strongly-interacting clouds, we observe hydrodynamic behaviour in normal-phase Bose gases, including the maximally hydrodynamic unitary regime. We avoid the atom losses that often hamper experimental access of this regime by using radio-frequency injection, which switches on interactions much faster than trap or loss timescales. At low phase-space densities, we find excellent agreement with a collisional model based on the Boltzmann equation. At higher phase-space densities our results show a deviation from this model in the vicinity of an Efimov resonance, which cannot be accounted for by measured losses.

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