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The Degenerate Unitary Bose Gas CATHERINE KLAUSS, XIN XIE, ERIC CORNELL, DEBORAH JIN, JILA, NIST and University of Colorado at Boulder — The degenerate unitary Bose gas has generally been deemed experimentally inaccessible because of three-body loss rates that increase dramatically with increasing scattering length, a . Starting with a ^{85}Rb BEC, we investigate dynamics of a unitary Bose gas for timescales that are short compared to the loss. We find that the momentum distribution of the unitary Bose gas evolves on timescales fast compared to losses, and that both the timescale for this evolution and the limiting shape of the momentum distribution are consistent with universal scaling with density. This work demonstrates that a unitary Bose gas can be created and probed dynamically, and thus opens the door for further exploration of this novel strongly interacting quantum liquid.

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