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Critical velocity for superfluid flow across the BEC-BCS crossover

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Critical velocities have been observed in an ultracold superfluid Fermi gas throughout the BEC-BCS crossover. A pronounced peak of the critical velocity at unitarity demonstrates that superfluidity is most robust for resonant atomic interactions. Critical velocities were determined from the abrupt onset of dissipation when the velocity of a moving one-dimensional optical lattice was varied. The dependence of the critical velocity on lattice depth and on the inhomogeneous density profile was studied.