

**COHERENT SLOWING OF A SUPERSONIC BEAM WITH  
AN ATOMIC PADDLE**

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We report the coherent slowing of a supersonic beam of ground-state helium atoms by elastic reflection from single crystals mounted on a rotating paddle. The beam is slowed to a mean velocity of 230 m/s, entering a new regime of He-surface scattering at low energy where quantum effects become important. This beam will be used to probe atom-surface potentials and for atom optics and interferometry based on single crystals.