

Abstract Submitted  
for the DAMOP12 Meeting of  
The American Physical Society

**Quantum flutter of supersonic particles in one-dimensional quantum liquids**<sup>1</sup> CHARLES MATHY, Institute for Theoretical Atomic, Molecular and Optical Physics, MIKHAIL ZVONAREV, EUGENE DEMLER, Physics Department, Harvard University — We study the dynamics of an impurity injected at a supersonic velocity into a 1D gas of hardcore bosons, or faster than the Fermi velocity in a fully polarized Fermi gas. We find that at long times the momentum of the impurity does not decay to zero, and demonstrate that the system exhibits a new type of coherent oscillation in which the impurity vibrates with respect to its correlation hole.

<sup>1</sup>C.M. acknowledges support from the NSF through ITAMP at Harvard University and the Smithsonian Astrophysical Observatory.

Charles Mathy  
Institute for Theoretical Atomic, Molecular and Optical Physics

Date submitted: 27 Jan 2012

Electronic form version 1.4