

Abstract Submitted  
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**Direct Observation of the Opening and Closing of Inelastic Scattering Channels**<sup>1</sup> S.D. GENSEMER, R.B. MARTIN, K. GIBBLE, Penn State, Department of Physics, S.J.J.M.F. KOKKELMANS, Eindhoven Technical University — We observe the abrupt changes of scattering phase shifts as a function of collision energy and magnetic field. Scattering atoms form a multi-channel system, where a distinction can be made between energetically open and closed channels. When the collision energy increases, inelastic collision channels open, yielding an abrupt change in the scattering phase shift at the threshold. We directly observe the difference of s-wave scattering phase shifts in our juggling cesium fountain clock by detecting only the scattered part of the atomic wavefunctions <sup>2</sup>. Here, we study the scattering of the cesium clock states scattering off of cesium atoms prepared in  $F=3, m_F$ .

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<sup>2</sup>R. A. Hart, X. Xu, R. Legere, & K. Gibble, Nature 446, 892-895 (2007).

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