Abstract Submitted
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Suppression of inelastic collisions in atom waveguides VLADIMIR YUROVSKY, School of Chemistry, Tel Aviv University, YEHUDA BAND, Departments of Chemistry, Electro-Optics, and The Ilse Katz Center for Nano-Science, Ben-Gurion University of the Negev — Collisional deactivation is analyzed using a multichannel zero-range potential method. The deactivation products are associated to a set of open channels, while introduction of a closed channel leads to a Feshbach resonance, allowing control of elastic scattering. In the case of free space the deactivation rate coefficient has a finite zero-energy limit. It increases with the elastic scattering length, demonstrating also the effect of interference of open and closed channel deactivation. A tight confinement in atomic waveguides leads to a drastic change of the deactivation rate behavior. At large elastic scattering length, the rate coefficient decreases to zero at low collision energies. The present two-body analysis is in agreement with the many-body consideration of indistinguishable particles [1], being applicable to non-identical particles as well. The general behavior of two-body correlations [1] can be reproduced in the present two-body picture. 1. D. M. Gangardt and G. V. Shlyapnikov, Phys. Rev. Lett. **90**, 010401 (2003).

Vladimir Yurovsky
School of Chemistry, Tel Aviv University

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