Abstract Submitted
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Quantum statistical properties in the three-body recombination rate of ultracold bosonic and fermionic atoms[1] HUI LI, Department of Physics, Temple University, EITE TIESINGA, Joint Quantum Institute and Joint Center for Quantum Information and Computer Science, National, Institute of Standards and Technology and University , SVETLANA KOTOCHIGOVA, Department of Physics, Temple University — We theoretically investigate collisions among ultracold bosonic and fermionic atoms and molecules in an external magnetic field. We study three-body recombination processes near magnetic Feshbach resonances, where the rate coefficients are resonantly enhanced. Our simulations show that this enhancement is controlled by quantum statistics leading to line shapes with a unique partial wave and temperature behavior. In particular, we obtained a striking difference in the temperature-dependence of the three-body recombination rate of s- and d- wave entrance-channel Feshbach resonances for colliding bosonic Er atoms [1], whereas in p-wave fermionic mixtures of Li+Li+Yb, the rate has a maximum value that is independent of temperature [2]. [1] T. Maier, H. Kadau, M. Schmitt, M. Wenzel, I. Ferrier-Barbut, T. Pfau, A. Frisch, S. Baier, K. Aikawa, L. Chomaz, M. J. Mark, F. Ferlaino, C. Makrides, E. Tiesinga, A. Petrov, and S. Kotochigova, Phys. Rev. X **5**, 041029 (2015). [2] A. Green, H. Li, J.H.S. Toh, X.X. Tang, K. McCormick, M. Li, E. Tiesinga, S. Kotochigova, and S. Gupta, submitted to PRX (2019), arXiv:1912.04874v.

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