

Abstract Submitted
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Bose Fireworks 2.0. JIAZHONG HU, LEI FENG, LOGAN W. CLARK, CHENG CHIN, James Franck Institute, Enrico Fermi Institute and Department of Physics, the University of Chicago — When the scattering length of a Bose-Einstein condensate is periodically modulated, atoms in the condensate can form numerous jets emitting in all directions, resembling fireworks. With an increasing modulation strength, we observe a high-order harmonic generation of matter-waves where emitted atoms form a multi-ring structure with quantized energy and momentum. Based on the evolution dynamics, we find that atoms in the high order rings originate from multiple scattering processes. With the assistance of pattern recognition, we identify a unique 10-jet pattern in the emission that reveals intricate correlations between atomic populations in different momentum modes. We propose that the jet pattern is a result of Bose stimulation of secondary collisions into modes with macroscopic population.

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