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Correlations of Bose fireworks emission from strongly driven Bose-Einstein condensates. LEI FENG, JIAZHONG HU, LOGAN W. CLARK, CHENG CHIN, James Frank Institute, Enrico Fermi Institute, and Department of Physics, the University of Chicago — Bose-Einstein condensates with oscillating interactions enables exciting opportunities to study far from equilibrium dynamics in quantum many-body physics. Based on a fast modulation of magnetic field near a Feshbach resonance, we observe high harmonic generation of matter-wave jets from cesium condensates. The quantization of energy and momentum of atoms in the jets results from the Bose stimulation. With the assistance of pattern recognition, we are able to identify various scattering processes that leads to the pattern, further confirmed by correlation analysis. We also observe intricate high-order correlations which can not be fully decomposed to lower order correlations. Our observation can be modeled based on the hierarchy of inelastic collisions between atoms in the driven condensate.

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