

Abstract Submitted
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Investigation of the coupling of the momentum distribution of a BEC with its collective of modes¹ EMANUEL HENN, PEDRO TAVARES, AMILSON FRITSCH, FRANKLIN VIVANCO, GUSTAVO TELLES, VANDERLEI BAGNATO, Physics Institute of São Carlos - University of São Paulo — In our group we have a strong research line on quantum turbulence and the general investigation of Bose-Einstein condensates (BEC) subjected to oscillatory excitations. Inside this research line we investigate first the behavior of the normal modes of the BEC under this excitation and observe a non-linear behavior in the amplitude of the quadrupolar mode. Also, inside this same procedure of investigation we study the momentum distribution of a BEC to understand if it is possible to extract Kolmogorov like excitation spectra which would point to a turbulent state of matter. The condensate is perturbed, and we let it evolve in-trap after which we perform standard time-of-flight absorption imaging. The momentum distribution is extracted and analyzed as a function of the in-trap free evolution time for a 2D projected cloud. We show that the momentum distribution has its features varying periodically with the same frequency as the quadrupolar mode displayed by the atomic gas hinting at a strong coupling of both. The main consequence of that one cannot be assertive about the quantitative features of the extract spectrum of momentum and we can only rely on its qualitative features.

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