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In this presentation, I will discuss the effect of different trapping potential on a fast rotating Bose-Einstein condensate. Particular attention will be given to a condensate trapped by a harmonic plus quartic trap and also by a harmonic plus Gaussian trap. Two different approximation are utilised to describe the behaviour: a lowest Landau level analysis and a Thomas-Fermi analysis. These are backed up by numerical simulations which will be shown during the presentation.

References

- [1] A. Aftalion, *Vortices in Bose-Einstein condensates*, Birkhauser, 2006.
- [2] A. Aftalion, X. Blanc and J. Dalibard, Physical Review A **71**, 023611 (2005).
- [3] A. L. Fetter, B. Jackson and S. Stringari, Physical Review A **71**, 013605 (2005).