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Radu Ignat and **Vincent Millot***, Department of Mathematical Sciences, Carnegie Mellon University, Wean Hall, Room 6113, Pittsburgh, PA 152133890. *Vortices in 2D Bose-Einstein condensates.*

We study the minimizers of the Gross-Pitaevskii energy for a two dimensional Bose-Einstein condensate placed in a rotating trap. We estimate the critical rotational speed for having d vortices and we determine the location of the vortices. Our method relies on an asymptotic expansion of the non-dimensionalized energy with respect to a small parameter, the limit case corresponding to the Thomas-Fermi regime. This is a joint work with R. Ignat. (Received August 24, 2005)