Phase transitions and Vortex Stripes in Two Component Bose Einstein Condensates

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The combined effect of rotation and spin orbit coupling in two component Bose Einstein condensates can lead to new vortex patterns, namely stripes or sheets. We will analyze this in the framework of the Gross Pitaevskii energy. We will show new energy estimates in the segregation case allowing to characaterize the vortex patterns in each component. We will also present a study of a Modica-Mortola energy with a Neumann boundary condition leading to stripes.
This is based on two joint works, one with Etienne Sandier and one with Remy Rodiac.