Spatial decay of rotating waves in parabolic systems

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In this talk we study solutions of nonlinear systems

$$A\triangle v(x) + \langle Sx, \nabla v(x)\rangle + f(v(x)) = 0,\ x \in \mathbb{R}^d,\ d \geqslant 2.$$

The linear operator is of Ornstein-Uhlenbeck type with an unbounded drift term defined by a skew-symmetric matrix $S \in \mathbb{R}^{d,d}$. Equations of this form determine the shape and angular speed of rotating waves in time-dependent reaction diffusion systems. We prove under certain conditions that every classical solution which falls below a certain threshold at infinity, must decay exponentially in space. Examples for such solutions are spinning solitons arising from the quintic-cubic complex Ginzburg-Landau equation. This study is motivated by the stability problem for rotating waves in several variables.