Diffusive spin-charge dynamics in an external electric field
TUDOR-DAN STANESCU, BRANDON ANDERSON, VICTOR GALITSKI, University of Maryland — We study the dynamics of a spin density injected into a two-dimensional electron system with generic spin-orbit interactions. We generalize the spin-charge diffusion equation formalism by including the effects of a uniform electric field. Within this approach, we study the coupling between spin and charge and we determine the charge (spin) profile induced by a non-uniform, periodic spin (charge) density in the presence of the external electric field. We determine the optimal range of parameters for observing the spin-charge coupling effects.