then \[ u(x) \] has energy \[ E = \lambda^2 - 6 E \]

1. lowest energy solution has energy zero

...need term of fourth order in the derivative to stabilize the solution.

...This model is the Skyrmion model

92) Skyrmion model

Define \[ \mathcal{L}_u = u + \mathcal{D}_u \nabla \]

then Skyrmion term

\[ P_s = -\frac{\partial}{\partial u} + \mathcal{L}_u \mathcal{L}_u + \frac{c^2}{d^2} Tr \left[ \mathcal{L}_u \mathcal{L}_u \right] \]

\[ E_A = \lambda^2 \mathcal{E}_u + \lambda^2 \mathcal{E}_u \]

...\[ d = 2 \]

Note that \[ Tr \mathcal{L}_u \mathcal{L}_u = \frac{\lambda}{2} Tr \mathcal{D}_u \mathcal{D}_u \]