1107-35-319 **Shijun Zheng*** (szheng@georgiasouthern.edu), Department of Mathematical Sciences, Georgia Southern University, Statesboro, GA 30460. *Long time existence for magnetic nonlinear Schrödinger equations.*

Denote by $\mathcal{L} = -\frac{1}{2}\nabla_A^2 + V$ the Schrödinger operator with electromagnetic potentials, where A is sublinear and V subquadratic. The NLS mechanism generated by $\mathcal{L}$ in the semiclassical regime obeys the Newton's law

$$\begin{aligned} \dot{x} &= \xi \\ \dot{\xi} &= -\nabla V(x) - \xi \times B(x) \end{aligned}$$

in the transition from quantum to classical mechanics, which can be derived by the Euler-Lagrange equation. Here $B = \nabla \times A$ is the magnetic field induced by A and the Lorentz force is given by $-\xi \times B$. The energy density $H(t) := \frac{1}{2}|\xi(t)|^2 + V(x(t))$ is conserved in time. We study the fundamental solution for $e^{-it\mathcal{L}}$ and consider the threshold for the global existence and blowup for the NLS. (Received January 18, 2015)