$$\frac{\partial S_\epsilon(\mathbf{r},t)}{\partial t} = -\frac{1}{2m}[\nabla S_\epsilon(\mathbf{r},t)]^2 - \left[V(\mathbf{r},t) - \epsilon\frac{\hbar^2}{2m}\frac{\nabla^2 A_\epsilon(\mathbf{r},t)}{A_\epsilon(\mathbf{r},t)}\right]$$