Let $\Psi = \Psi(x, t, x_0)$ be the solution of Shrodinger equation

$$i\hbar \frac{\partial \Psi}{\partial t} = \hat{H}\Psi$$

with boundary condition

$$\Psi(x, t; x_0)\big]|_{t=0} = \delta(x - x_0)$$

In quasiclassical approximation

$$\Psi(x, t; x_0) = A(x, t) e^{\frac{i}{\hbar} S(x,t,x_0)}$$

Consider the condition that norm is preserved in quasiclassical approximation $\hbar \to 0$:

$$\delta(x_0 - x_1) = \int \bar{\Psi}(x, x_0, t)\Psi(x, x_1, t) dx =$$

$$\int A(x, x_0, t) A(x, x_1, t) e^{\frac{i}{\hbar}(S(x,x_1,t) - S(x,x_0,t))} dx \approx$$

$$\int A(x, x_0, t) A(x, x_1, t) e^{\frac{i}{\hbar}(x_1 - x_0) \frac{\partial S(x,x_0,t)}{\partial x_0}} dx \approx \int A^2(x, x_0, t) e^{\frac{i}{\hbar}(x_1 - x_0)\rho_0} dx =$$

$$\int e^{\frac{i}{\hbar}(x_1 - x_0)\rho_0} A^2 dx = \delta(x_0 - x_1) = \int e^{\frac{i}{\hbar}(x_1 - x_0)\rho_0} d\rho_0 \,. \tag{1}$$

Hence $A^2 dx = d\rho_0$, i.e.

$$A = \sqrt{\frac{\partial \rho_0}{\partial x}} = \sqrt{\frac{\partial^2 S(x, x_0, t)}{\partial x_0 \partial x}} \,. \tag{2}$$

These are calculations of Fock "naoborot"!