Diffusion

Solving the diffusion equation

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1 Continuity Equation

$$\frac{\partial \rho}{\partial t} + \nabla \cdot \mathbf{j} = \sigma \tag{1.1}$$

ρ is the number density of a particular particle in units of L^{-3}. $\mathbf{j}$ is the number of particles passing though a unit area per second in a particular direction (hence it being a vector) in units $L^{-2}T^{-1}$