$$\frac{\partial P(\vec{x},t)}{\partial t} = \sum_{E}^{10} - p_E(\vec{x})P(\vec{x},t) + p_E(\vec{x}-\Delta\vec{x}_E)P(\vec{x}-\Delta\vec{x}_E,t)$$

$$\Delta x_i^0 = 1,\ \rho_1 = (1 - N_j^0 - N_j^1)N_i^0 M^{-1}$$
$$\Delta x_i^1,\ \rho_2 = (1 - N_j^0 - N_j^1)N_i^1 M^{-1} = 1$$
$$\Delta x_i^0 = -1,\ \Delta x_j^0 = 1,\ \rho_3 = N_i^0 N_j^1 M^{-1}$$
$$\text{for } |j-i| = 1$$

$$\Delta x_i^0 = 1,\ p_4 = (1 - N_i^0 - N_i^1)N_i^0 M^{-1}$$
$$\Delta x_i^0 = 1,\ \Delta x_i^1 = -1,\ p_5 = N_i^0 N_i^1 M^{-1}$$
$$\Delta x_i^0 = -1,\ \Delta x_i^1 = 1,\ p_6 = N_i^0 N_i^1 M^{-1}$$
$$\Delta x_i^1 = 1,\ p_7 = (1 - N_i^0 - N_i^1)N_i^1 M^{-1}$$
$$\Delta x_i^1 = -1,\ p_8 = (1 - N_i^0 - N_i^1)N_i^1 (1 - r_1) M^{-1}$$
$$\Delta x_i^0 = -1,\ p_9 = (1 - N_i^0 - N_i^1)N_i^0 (1 - r_0) M^{-1}$$

$$p_{10} = N_i^0 U_b M^{-1}$$