

$$a_{t,x} = a_{t-\Delta t,x} + \Delta t \cdot \left(s \cdot \left(\frac{a_{t-\Delta t,x}^2 + b_a}{b_{t-\Delta t,x} + c_{t-\Delta t,x}} \right) - r_a a_{t-\Delta t,x} + D_a \frac{\partial^2 a_t}{\partial x^2} \right)$$