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Upstream advection equation on staggered grid:

$$\psi_i^{N+1} = \psi_i^N - \left\{ F\left(\psi_i^N, \psi_{i+1}^N, u_{i+1/2}^N\right) - F\left(\psi_{i-1}^N, \psi_i^N, u_{i-1/2}^N\right) \right\}, \qquad (1)$$

where

$$F\left(\psi_i^N, \psi_{i+1}^N, u_{i+1/2}^N\right) = \left[\left(u_{i+1/2}^N + \left|u_{i+1/2}^N\right|\right) \psi_i^N + \left(u_{i+1/2}^N + \left|u_{i+1/2}^N\right|\right) \psi_{i+1}^N \right] \frac{\Delta t}{2\Delta x}. \qquad (2)$$

This gives

$$\psi_i^{N+1} = \psi_i^N - \left[\left(u_{i+1/2}^N + \left|u_{i+1/2}^N\right|\right) \psi_i^N + \left(u_{i+1/2}^N + \left|u_{i+1/2}^N\right|\right) \psi_{i+1}^N \right] \frac{\Delta t}{2\Delta x} \qquad (3)$$