



K

Modern Perspectives in Applied Mathematics: Theory and Numerics of PDEs

In honor of Eitan Tadmor's 60th birthday

April 28 - May 2, 2014

Hyatt Regency Bethesda, MD

$$v_{i+1}(t+\Delta t) = \frac{1}{2}[v_i(t) + v_{i+1}(t)] + \frac{1}{8}[v'_i - v'_{i+1}] - \lambda[f(v(x_{i+1}, t + \frac{\Delta t}{2})) - f(v(x_i, t + \frac{\Delta t}{2}))]$$

$$v(x_i, t + \frac{\Delta t}{2}) = v_i(t) - \frac{1}{2} \lambda f'_i \frac{\partial \rho}{\partial t} + \sum_{i=1}^N \frac{\partial}{\partial x_i} (A_i(\rho)) - \sum_{i,j=1}^N \frac{\partial^2}{\partial x_i \partial x_j} (A_{ij}(\rho)) = 0 \text{ in } \mathbb{R}^N \times (0, \infty)$$

$$\frac{d}{dt} v_i(t) = \alpha \sum_{j \neq i} a_{ij} (v_j(t) - v_i(t)), \quad a_{ij} := \frac{1}{\sigma_i} \phi_{ij}, \quad \sigma_i = \sum_k \phi_{ik}$$

Let $f \in W_{loc}^{\sigma,p}(\mathbb{R}^d \times \mathbb{R})$, $\sigma \geq 0$, $1 < p \leq 2$,

$$\mathcal{L}(\nabla_x, v) f(x, v) = \partial_v g(x, v), \quad g \in \begin{cases} L^q(\mathbb{R}^d \times \mathbb{R}) & 1 < q \leq 2 \\ M(\mathbb{R}^d \times \mathbb{R}) & q = 1 \end{cases}$$

$$u_{j+1} - \frac{1}{2\lambda_{j+1}} \operatorname{div} \left(\frac{\nabla u_{j+1}}{\nabla u_{j+1}} \right) = \frac{1}{2\lambda_j} \operatorname{div} \left(\frac{\nabla u_j}{\nabla u_j} \right) \sum_{i=0}^j \left[\frac{1}{\lambda_i} \|u_i\|_{BV} + \|u_i\|_2^2 \right] = \|f\|$$

$$K_N^\sigma f(x) := \frac{\pi i}{c_\sigma} \sum_{|k| \leq N} \operatorname{sgn}(k) \sigma\left(\frac{|k|}{N}\right) \hat{f}(k) \int \sigma(\xi) d\xi$$

Eitan Tadmor

