

1)  $\psi$  гу қозғолуу (мемкопробоғуу)

$$T_t = k \nabla^2 T \quad - \text{мисал}$$

$$T_t = k T_{xx} \quad - \text{сгн мисал}$$

$$T_{i+1, j} = T_{i, j} + k \frac{T_{i, j-1} - 2T_{i, j} + T_{i, j+1}}{\Delta x^2} \Delta t$$

$$\frac{T_{i+1, j} - T_{i, j}}{\Delta t} = \frac{T(t + \Delta t, x) - T(t, x)}{\Delta t}$$

FTCS - Forward Time Central Space

2)  $\psi$  мисал

$$T(t, x) = \sum_{n=-\infty}^{\infty} A_n e^{i \lambda_n x} \quad - \text{пай. гопол}$$

$$\left| \frac{A_{i+1}}{A_i} \right| \leq 1 \quad |A_{i+1}| \leq |A_i|$$

$i \sim$  бремс

$A_{i+1}$   $\psi$  мисал.  $n^0$  гопол  $\psi$  мисал

3) (xozymuoms)

$$T_{i+1,j} = T_{i,j} + \frac{\partial T_{i,j}}{\partial t} \Delta t + \frac{1}{2} (\Delta t)^2 \frac{\partial^2 T_{i,j}}{\partial t^2} + \dots$$

$$T_{i,j+1} = T_{i,j} + \frac{\partial T_{i,j}}{\partial x} \Delta x + \frac{1}{2} (\Delta x)^2 \frac{\partial^2 T_{i,j}}{\partial x^2} + \dots$$

$$T_{i,j-1} = T_{i,j} - \dots$$

4) Bumbog yd memonpobozhnomu



$$\begin{aligned} T_{i+1,j} - T_{i,j} &= \\ &= d \left( \frac{T_{i,j+1} + T_{i,j-1}}{2} - T_{i,j} \right) \\ &= d \frac{(T_{i,j+1} - T_{i,j}) + (T_{i,j-1} - T_{i,j})}{2} \end{aligned}$$

$d \leq \frac{1}{2}$   $C \leq 1$  ymo kypama  
 ym. kypama - go pygpxca - leb

kan. yur

$$T(0, x) = e^{-x^2}$$

Γραμμ. yur.

$$T(t, x_{\min}) = T(t, x_{\max})$$

$$T(t, x_{\max}) = \dots$$

$$T_x(t, x_{\min}) = 0$$

5) Упр. непрерыва

$$p_t = -\nabla \cdot (p \vec{v}) \quad \vec{v} - \text{скорость}$$

$$p_t = -\rho_x v$$

$$\frac{p_{i+1,j} - p_{i,j}}{\Delta t} = \frac{p_{i,j,t+\tau} - p_{i,j-\tau}}{2\Delta x} v$$

*разность значений*
*сред. разн.*

$$\frac{p_{i+1,j} - p_{i,j}}{\Delta x} = \frac{p_{i,j} - p_{i,j-\tau}}{\Delta t} v$$

*разн. сред.*

$$m_{i+1,j} - m_{i,j} = d (m_{i,j-\tau} - m_{i,j})$$

$$0 \leq |d| = \left| v \frac{\Delta t}{\Delta x} \right| \leq 1$$

$$d = 1$$

$$m_{i+1,j} - m_{i,j} = m_{i,j-\tau} - m_{i,j}$$

