Постановка задачи

Задача (24):

$$\rho_0(x) = \begin{cases} 1, & x < 4.5 \text{ или } x > 5.5, \\ 2, & x \in [4.5; 5.5], \end{cases} \qquad u_0(x) \equiv 0,$$

с граничными условиями

$$u(t,0) = u(t,10) = 0, \quad x \in [0;10], \quad t \in [0;T].$$

Задача (25):

$$u_0(x) = \begin{cases} 0, & x < 4.5 \text{ или } x > 5.5, \\ 1, & x \in [4.5; 5.5], \end{cases} \qquad \rho_0(x) \equiv 1,$$

с граничными условиями

$$u(t,0) = u(t,10) = 0, \quad x \in [0;10], \quad t \in [0;T].$$

В обеих задачах функция f тождественно равна нулю.

Далее приведены таблицы со значениями нормы

$$\|(H^{n_{st}}, V^{n_{st}}) - (\tilde{H}, \tilde{V})\|_{C_h}$$

и изменения массы

$$\Delta_m(n) = \frac{\sum\limits_{m\in\bar{\omega}_h} H_m^0 - \sum\limits_{m\in\bar{\omega}_h} H_m^n}{\sum\limits_{m\in\bar{\omega}_h} H_m^0}$$

Сравнение по методу вложенных сеток проводилось на уровне $n_{st}/10$. Условием выхода на стационар считалось

$$\|(H^{n_{st}}, V^{n_{st}}) - (\tilde{H}, \tilde{V})\|_{C_h} <= 3 * 10^{-3}$$

Также таблицы содержат времена стабилизации $T_{st} = \tau \cdot n_{st}$ решений систем.

Данные 24, плотность

$\mu = 0.1, p(\rho) = 1\rho, h = 0.001, \tau = 0.0005$				
	$n_{st}/4$	$n_{st}/2$	$3n_{st}/4$	$n_{st}, (221.6125)$
$norm$	$6.335917e-02$	$1.761714e-02$	$7.228164e-03$	$2.999897e-03$
Δ_{massa}	$-8.497222e-05$	$-9.194601e-05$	$-9.062774e-05$	$-9.094270e-05$

$\mu = 0.1, p(\rho) = 1\rho$	
	tau= 0.0005 ,h= 0.001
$h - h^1$	$1.359262e-02$ $1.755467e-03$ $2.907941e+00$
$h - h^2$	$1.273265e-02$ $1.594230e-03$ $2.908683e+00$
$h - h^3$	$1.166943e-02$ $1.515216e-03$ $2.909050e+00$

$\mu = 0.01, p(\rho) = 1\rho, h = 0.001, \tau = 0.0005$				
	$n_{st}/4$	$n_{st}/2$	$3n_{st}/4$	$n_{st}, (1029.5975)$
$norm$	$2.884721e-02$	$1.181850e-02$	$7.154859e-03$	$2.999901e-03$
Δ_{massa}	$-9.731352e-04$	$-9.755389e-04$	$-9.758735e-04$	$-9.769669e-04$

$\mu = 0.01, p(\rho) = 1\rho$	
	tau= 0.0005 ,h= 0.001
$h - h^1$	$2.483872e-03$
	$1.984384e-03$
	$1.122251e+00$
$h - h^2$	$2.870128e-03$
	$2.840468e-03$
	$1.122289e+00$
$h - h^3$	$3.354881e-03$
	$3.282126e-03$
	$1.122335e+00$

$\mu = 0.001, p(\rho) = 1\rho, h = 0.001, \tau = 0.0005$				
	$n_{st}/4$	$n_{st}/2$	$3n_{st}/4$	$n_{st}, (1888.4165)$
$norm$	$1.663703e-02$	$8.284412e-03$	$7.053292e-03$	$2.999551e-03$
Δ_{massa}	$-8.600899e-03$	$-8.616679e-03$	$-8.619704e-03$	$-8.620794e-03$

$\mu = 0.001, p(\rho) = 1\rho$	
	tau= 0.0005 ,h= 0.001
$h - h^1$	$3.996291e-02$
	$1.819218e-02$
	$9.548312e-01$
$h - h^2$	$5.274678e-02$
	$2.739384e-02$
	$9.730823e-01$
$h - h^3$	$5.724268e-02$
	$3.203174e-02$
	$9.780669e-01$

$\mu = 0.1, p(\rho) = 10\rho, h = 0.001, \tau = 0.0005$				
	$n_{st}/4$	$n_{st}/2$	$3n_{st}/4$	$n_{st}, (187.483)$
$norm$	$5.051679e-02$	$4.076296e-02$	$1.138141e-02$	$2.997576e-03$
Δ_{massa}	$-9.706896e-04$	$-9.766310e-04$	$-9.769931e-04$	$-9.773238e-04$

$\mu = 0.1, p(\rho) = 10\rho$	
	tau= 0.0005 ,h= 0.001
$h - h^1$	$4.876355e-03$
	$2.105070e-03$
	$1.707818e+00$
$h - h^2$	$4.803402e-03$
	$2.880025e-03$
	$1.707873e+00$
$h - h^3$	$4.574847e-03$
	$3.292906e-03$
	$1.707911e+00$

$\mu = 0.01, p(\rho) = 10\rho, h = 0.001, \tau = 0.0005$				
	$n_{st}/4$	$n_{st}/2$	$3n_{st}/4$	$n_{st}, (589.1985)$
$norm$	$5.722927e-02$	$2.049438e-02$	$8.492197e-03$	$2.999695e-03$
Δ_{massa}	$-8.653346e-03$	$-8.666267e-03$	$-8.669624e-03$	$-8.669853e-03$

$\mu = 0.01, p(\rho) = 10\rho$	
	tau= 0.0005 ,h= 0.001
$h - h^1$	$1.753049e-02$
	$1.554916e-02$
	$9.412415e-01$
$h - h^2$	$2.667826e-02$
	$2.403054e-02$
	$9.438508e-01$
$h - h^3$	$3.127825e-02$
	$2.849464e-02$
	$9.454865e-01$

$\mu = 0.001, p(\rho) = 10\rho, h = 0.001, \tau = 0.0005$				
	$n_{st}/4$	$n_{st}/2$	$3n_{st}/4$	$n_{st}, (2635.168)$
$norm$	$1.471174e-02$	$1.190990e-02$	$7.535936e-03$	$2.999813e-03$
Δ_{massa}	$-4.519133e-01$	$-4.519227e-01$	$-4.519242e-01$	$-4.519249e-01$

$\mu = 0.001, p(\rho) = 10\rho$	
	tau= 0.0005 ,h= 0.001
$h - h^1$	$4.776488e-01$
	$1.465135e+00$
	$1.715252e+00$
$h - h^2$	$4.907690e-01$
	$1.507871e+00$
	$1.751919e+00$
$h - h^3$	$4.992168e-01$
	$1.535449e+00$
	$1.775727e+00$

$\mu = 0.1, p(\rho) = 100\rho, h = 0.001, \tau = 0.0005$				
	$n_{st}/4$	$n_{st}/2$	$3n_{st}/4$	$n_{st}, (121.3295)$
$norm$	$9.500607e-02$	$7.830013e-02$	$4.077086e-02$	$2.998778e-03$
Δ_{massa}	$-8.662192e-03$	$-8.691607e-03$	$-8.695618e-03$	$-8.696063e-03$

$\mu = 0.1, p(\rho) = 100\rho$	
	tau= 0.0005 ,h= 0.001
$h - h^1$	$1.299958e-02$
	$1.536093e-02$
	$1.188730e+00$
$h - h^2$	$2.014361e-02$
	$2.377904e-02$
	$1.189350e+00$
$h - h^3$	$2.388400e-02$
	$2.822526e-02$
	$1.189780e+00$

$\mu = 0.01, p(\rho) = 100\rho, h = 0.001, \tau = 0.0005$				
	$n_{st}/4$	$n_{st}/2$	$3n_{st}/4$	$n_{st}, (0.0325)$
$norm$	$1.426324e+01$	$1.177890e+01$	$3.286096e+02$	nan
Δ_{massa}	$-1.450957e-02$	$-2.548713e-02$	$-5.339185e-02$	$-nan$

$\mu = 0.01, p(\rho) = 100\rho$	
	tau= 0.0005 ,h= 0.001
$h - h^1$	$8.959867e-01$
	$1.374053e-01$
	$8.463612e+01$
$h - h^2$	$8.468772e-01$
	$1.437453e-01$
	$8.137679e+01$
$h - h^3$	$8.461886e-01$
	$1.441987e-01$
	$8.134313e+01$

$\mu = 0.001, p(\rho) = 100\rho, h = 0.001, \tau = 0.0005$				
	$n_{st}/4$	$n_{st}/2$	$3n_{st}/4$	$n_{st}, (0.0085)$
$norm$	$1.213832e+05$	$1.252954e+15$	$6.039943e+53$	nan
Δ_{massa}	$1.444504e-02$	$1.079080e+10$	$-1.645600e+50$	$-nan$

$\mu = 0.001, p(\rho) = 100\rho$	
	tau= 0.0005 ,h= 0.001
$h - h^1$	$1.325384e+00$
	$7.984948e-02$
	$9.877549e+01$
$h - h^2$	$1.314252e+00$
	$8.962793e-02$
	$9.866825e+01$
$h - h^3$	$1.535339e+00$
	$1.076403e-01$
	$1.160462e+02$

Данные 24, плотность, степенная зависимость

$\mu = 0.1, p(\rho) = \rho^{1.4}, h = 0.001, \tau = 0.001$				
	$n_{st}/4$	$n_{st}/2$	$3n_{st}/4$	$n_{st}, (216.463)$
$norm$	$5.681971e-02$	$1.864150e-02$	$7.515143e-03$	$2.999948e-03$
Δ_{massa}	$-2.977654e-04$	$-3.066084e-04$	$-3.057219e-04$	$-3.061398e-04$

$\mu = 0.1, p(\rho) = \rho^{1,4}$	
	tau= 0.001 ,h= 0.001
$h - h^1$	$1.042427e-02$
	$1.571591e-03$
	$2.499881e+00$
$h - h^2$	$9.622620e-03$
	$1.518655e-03$
	$2.500033e+00$
$h - h^3$	$8.754757e-03$
	$1.511313e-03$
	$2.499995e+00$

$\mu = 0.01, p(\rho) = \rho^{1.4}, h = 0.001, \tau = 0.001$				
	$n_{st}/4$	$n_{st}/2$	$3n_{st}/4$	$n_{st}, (903.835)$
$norm$	$2.208349e-02$	$1.044924e-02$	$6.598849e-03$	$2.998357e-03$
Δ_{massa}	$-2.991606e-03$	$-3.000915e-03$	$-3.002678e-03$	$-3.003029e-03$

$\mu = 0.01, p(\rho) = \rho^{1,4}$	
	tau= 0.001 ,h= 0.001
$h - h^1$	$1.123872e-02$
	$8.286158e-03$
	$1.132674e+00$
$h - h^2$	$1.696776e-02$
	$1.251547e-02$
	$1.133485e+00$
$h - h^3$	$1.983996e-02$
	$1.466402e-02$
	$1.134021e+00$

$\mu = 0.001, p(\rho) = \rho^{1.4}, h = 0.001, \tau = 0.001$				
	$n_{st}/4$	$n_{st}/2$	$3n_{st}/4$	$n_{st}, (1301.924)$
$norm$	$2.395606e-02$	$9.554427e-03$	$5.182929e-03$	$2.999678e-03$
Δ_{massa}	$-2.157569e-02$	$-2.161886e-02$	$-2.162690e-02$	$-2.162971e-02$

$\mu = 0.001, p(\rho) = \rho^{1,4}$	
	tau= 0.001 ,h= 0.001
$h - h^1$	$6.392893e-02$
	$5.462950e-02$
	$1.163546e+00$
$h - h^2$	$6.755622e-02$
	$7.621944e-02$
	$1.165135e+00$
$h - h^3$	$6.966330e-02$
	$8.796646e-02$
	$1.166136e+00$

Картинки

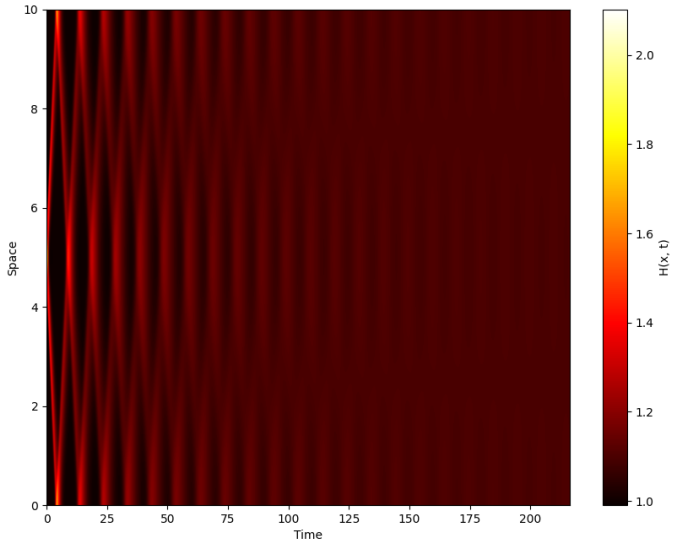

Figure 1: $\mu = 0.1, p(\rho) = 1\rho, h = 0.001, \tau = 0.01$, Плотность

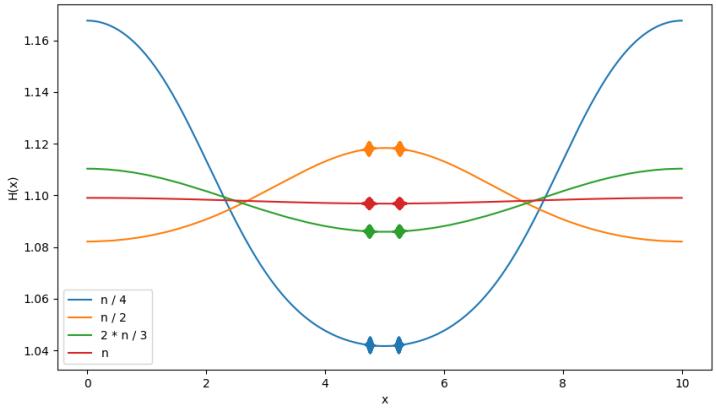

Figure 2: $\mu = 0.1, p(\rho) = 1\rho, h = 0.001, \tau = 0.01$, Плотность

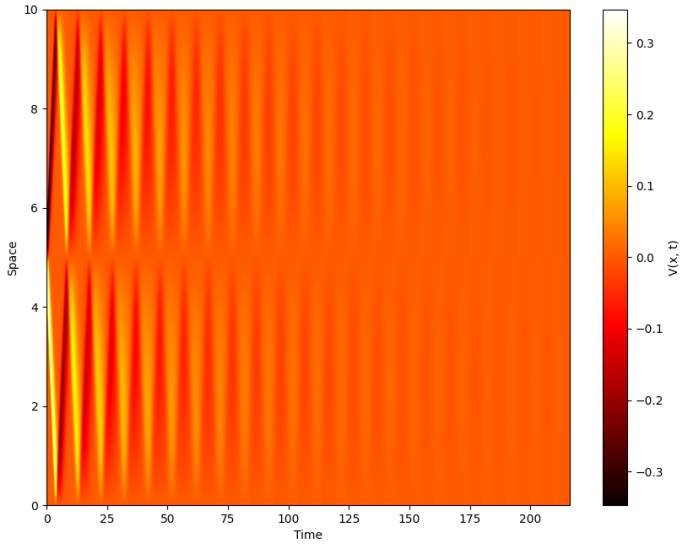

Figure 3: $\mu = 0.1, p(\rho) = 1\rho, h = 0.001, \tau = 0.01$, Скорость

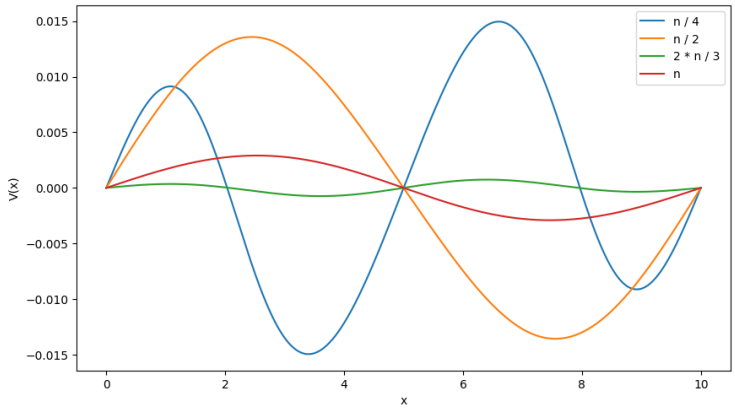

Figure 4: $\mu = 0.1, p(\rho) = 1\rho, h = 0.001, \tau = 0.01$, Скорость

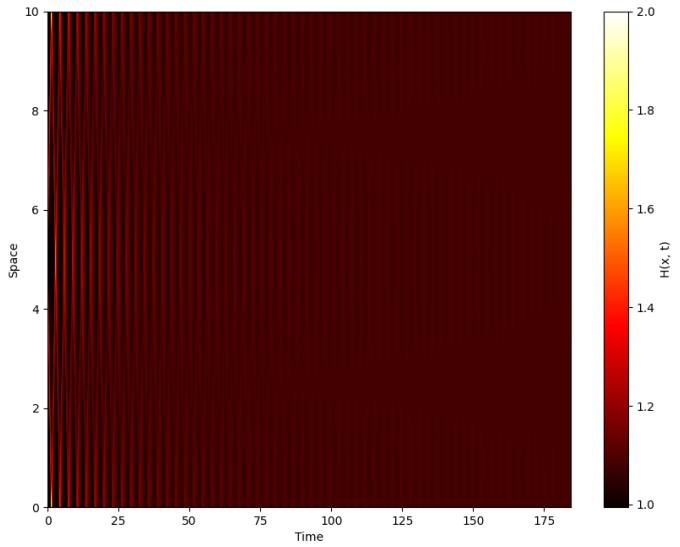

Figure 5: $\mu = 0.1, p(\rho) = 10\rho, h = 0.001, \tau = 0.01$, Плотность

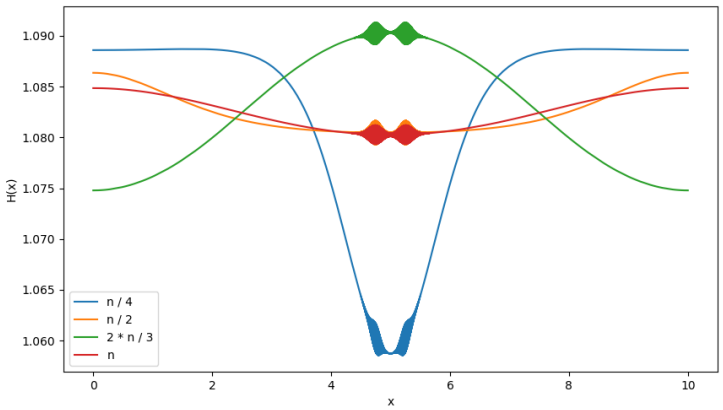

Figure 6: $\mu = 0.1, p(\rho) = 10\rho, h = 0.001, \tau = 0.01$, Плотность

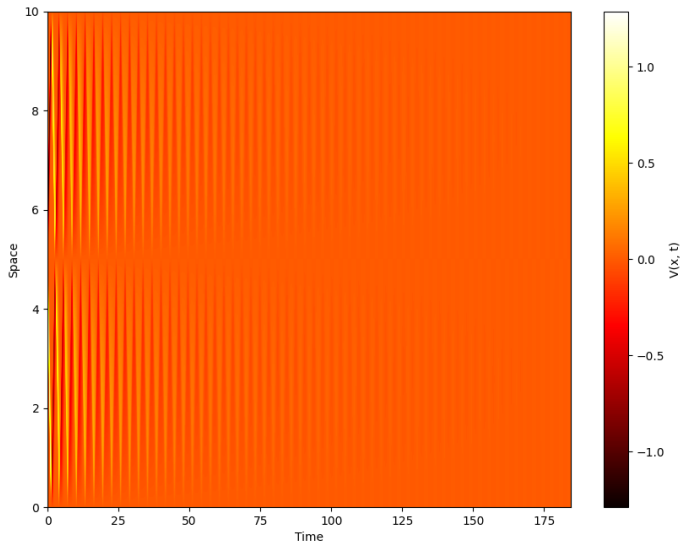

Figure 7: $\mu = 0.1, p(\rho) = 10\rho, h = 0.001, \tau = 0.01$, Скорость

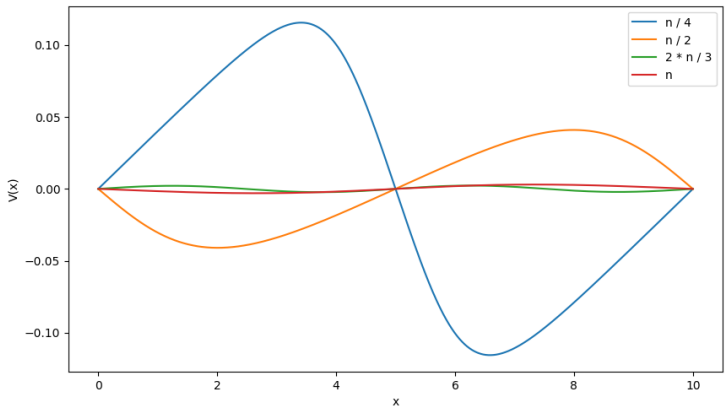

Figure 8: $\mu = 0.1, p(\rho) = 10\rho, h = 0.001, \tau = 0.01$, Скорость

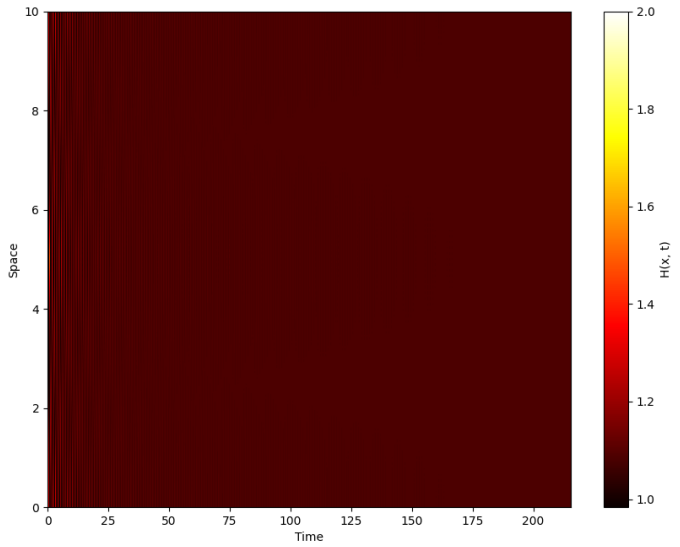

Figure 9: $\mu = 0.1, p(\rho) = 100\rho, h = 0.01, \tau = 0.001$, Плотность

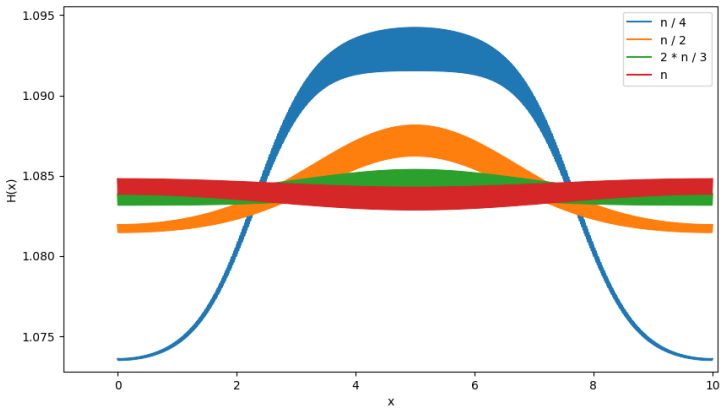

Figure 10: $\mu = 0.1, p(\rho) = 100\rho, h = 0.01, \tau = 0.001$, Плотность

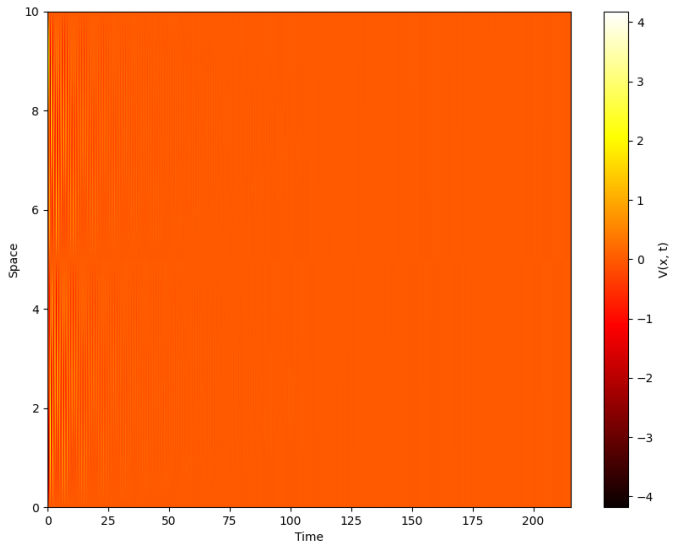

Figure 11: $\mu = 0.1, p(\rho) = 100\rho, h = 0.01, \tau = 0.001$, Скорость

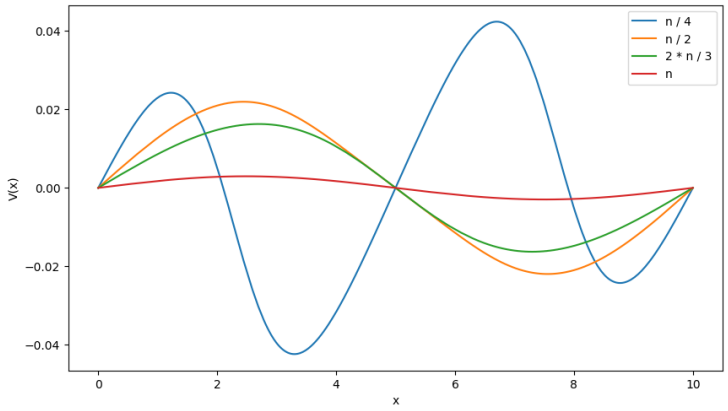

Figure 12: $\mu = 0.1, p(\rho) = 100\rho, h = 0.01, \tau = 0.001$, Скорость

Данные 25, плотность

$\mu = 0.1, p(\rho) = 1\rho, h = 0.01, \tau = 0.001$				
	$n_{st}/4$	$n_{st}/2$	$3n_{st}/4$	$n_{st}, (668.349)$
$norm$	$3.839660e-02$	$1.837735e-02$	$6.169164e-03$	$2.999325e-03$
Δ_{massa}	$-2.805473e-04$	$-2.704568e-04$	$-2.708536e-04$	$-2.713101e-04$

$\mu = 0.1, p(\rho) = 1\rho$	
	tau= 0.001 ,h= 0.01
$h - h^1$	$1.318447e-03$ $7.613866e-04$ $9.584584e-02$
$h - h^2$	$9.822267e-04$ $9.291926e-04$ $9.587787e-02$
$h - h^3$	$8.932684e-04$ $1.029921e-03$ $9.590548e-02$

$\mu = 0.01, p(\rho) = 1\rho, h = 0.01, \tau = 0.001$				
	$n_{st}/4$	$n_{st}/2$	$3n_{st}/4$	$n_{st}, (2696.025)$
$norm$	$1.031167e-02$	$7.200311e-03$	$6.532619e-03$	$2.999496e-03$
Δ_{massa}	$-2.652262e-03$	$-2.651142e-03$	$-2.653354e-03$	$-2.654120e-03$

$\mu = 0.01, p(\rho) = 1\rho$	
	tau= 0.001 ,h= 0.01
$h - h^1$	$8.067912e-03$
	$7.412692e-03$
	$4.912018e-01$
$h - h^2$	$1.220649e-02$
	$1.099125e-02$
	$4.914019e-01$
$h - h^3$	$1.428295e-02$
	$1.283583e-02$
	$4.915342e-01$

$\mu = 0.001, p(\rho) = 1\rho, h = 0.01, \tau = 0.001$				
	$n_{st}/4$	$n_{st}/2$	$3n_{st}/4$	$n_{st}, (4432.029)$
$norm$	$1.043870e-02$	$8.910663e-03$	$5.280984e-03$	$2.999562e-03$
Δ_{massa}	$-1.834481e-02$	$-1.835165e-02$	$-1.835915e-02$	$-1.835982e-02$

$\mu = 0.001, p(\rho) = 1\rho$	
	tau= 0.001 ,h= 0.01
$h - h^1$	$2.891479e-02$
	$3.581518e-02$
	$8.358497e-02$
$h - h^2$	$3.335960e-02$
	$5.178577e-02$
	$9.186983e-02$
$h - h^3$	$3.609001e-02$
	$6.169430e-02$
	$9.803321e-02$

$\mu = 0.1, p(\rho) = 10\rho, h = 0.01, \tau = 0.001$				
	$n_{st}/4$	$n_{st}/2$	$3n_{st}/4$	$n_{st}, (596.762)$
$norm$	$3.975561e-02$	$8.651050e-03$	$4.801005e-03$	$2.999910e-03$
Δ_{massa}	$-2.488496e-04$	$-2.553449e-04$	$-2.564704e-04$	$-2.565404e-04$

$\mu = 0.1, p(\rho) = 10\rho$	
	tau= 0.001 ,h= 0.01
$h - h^1$	$3.864145e-04$
	$5.330813e-04$
	$4.495568e-03$
$h - h^2$	$5.789405e-04$
	$7.987596e-04$
	$4.541646e-03$
$h - h^3$	$6.750737e-04$
	$9.319649e-04$
	$4.571391e-03$

$\mu = 0.01, p(\rho) = 10\rho, h = 0.01, \tau = 0.001$				
	$n_{st}/4$	$n_{st}/2$	$3n_{st}/4$	$n_{st}, (1577.446)$
$norm$	$1.069576e-02$	$8.405689e-03$	$7.585584e-03$	$2.999356e-03$
Δ_{massa}	$-2.456290e-03$	$-2.456908e-03$	$-2.458633e-03$	$-2.459232e-03$

$\mu = 0.01, p(\rho) = 10\rho$	
	tau= 0.001 ,h= 0.01
$h - h^1$	$1.201349e-02$
	$8.200527e-03$
	$2.306872e-02$
$h - h^2$	$1.654842e-02$
	$1.204669e-02$
	$3.053420e-02$
$h - h^3$	$1.837793e-02$
	$1.388256e-02$
	$3.332919e-02$

$\mu = 0.001, p(\rho) = 10\rho, h = 0.01, \tau = 0.001$				
	$n_{st}/4$	$n_{st}/2$	$3n_{st}/4$	$n_{st}, (3111.878)$
$norm$	$1.513513e-02$	$6.666290e-03$	$4.151094e-03$	$2.999496e-03$
Δ_{massa}	$-2.034701e-02$	$-2.038516e-02$	$-2.039229e-02$	$-2.039477e-02$

$\mu = 0.001, p(\rho) = 10\rho$	
	tau= 0.001 ,h= 0.01
$h - h^1$	$3.836405e-02$
	$3.564481e-02$
	$8.081182e-02$
$h - h^2$	$3.742961e-02$
	$5.325555e-02$
	$8.493130e-02$
$h - h^3$	$3.827886e-02$
	$6.009488e-02$
	$8.853184e-02$

$\mu = 0.1, p(\rho) = 100\rho, h = 0.01, \tau = 0.001$				
	$n_{st}/4$	$n_{st}/2$	$3n_{st}/4$	$n_{st}, (416.583)$
$norm$	$6.413318e-02$	$2.158382e-02$	$5.502423e-03$	$2.998807e-03$
Δ_{massa}	$-2.472916e-04$	$-2.536136e-04$	$-2.551573e-04$	$-2.555867e-04$

$\mu = 0.1, p(\rho) = 100\rho$	
	tau= 0.001 ,h= 0.01
$h - h^1$	$3.050130e-04$
	$4.493134e-04$
	$5.943127e-04$
$h - h^2$	$4.513209e-04$
	$6.710775e-04$
	$8.115232e-04$
$h - h^3$	$5.229668e-04$
	$7.812033e-04$
	$9.238038e-04$

$\mu = 0.01, p(\rho) = 100\rho, h = 0.01, \tau = 0.001$				
	$n_{st}/4$	$n_{st}/2$	$3n_{st}/4$	$n_{st}, (1492.911)$
$norm$	$2.975033e-02$	$1.912081e-02$	$8.641108e-03$	$2.998468e-03$
Δ_{massa}	$-2.640325e-03$	$-2.647241e-03$	$-2.649774e-03$	$-2.650962e-03$

$\mu = 0.01, p(\rho) = 100\rho$	
	tau= 0.001 ,h= 0.01
$h - h^1$	$8.178285e-03$
	$7.671919e-03$
	$1.458103e-02$
$h - h^2$	$8.869416e-03$
	$1.027256e-02$
	$1.619646e-02$
$h - h^3$	$9.106382e-03$
	$1.144787e-02$
	$1.697637e-02$

$\mu = 0.001, p(\rho) = 100\rho, h = 0.01, \tau = 0.001$				
	$n_{st}/4$	$n_{st}/2$	$3n_{st}/4$	$n_{st}, (0.16)$
$norm$	$1.017441e+00$	$9.159054e-01$	$2.660307e+00$	nan
Δ_{massa}	$-1.577254e-04$	$-8.152739e-04$	$-4.341561e-03$	$-nan$

$\mu = 0.001, p(\rho) = 100\rho$	
	tau= 0.001 ,h= 0.01
$h - h^1$	$4.148880e-02$
	$1.075825e-02$
	$1.540234e+00$
$h - h^2$	$3.103599e-02$
	$9.959213e-03$
	$1.267312e+00$
$h - h^3$	$3.636007e-02$
	$1.016260e-02$
	$1.267381e+00$

Данные 25, плотность, степенная зависимость

$\mu = 0.1, p(\rho) = \rho^{1.4}, h = 0.01, \tau = 0.001$				
	$n_{st}/4$	$n_{st}/2$	$3n_{st}/4$	$n_{st}, (625.827)$
$norm$	$2.812249e-02$	$1.489850e-02$	$7.357532e-03$	$2.999837e-03$
Δ_{massa}	$-2.680372e-04$	$-2.655706e-04$	$-2.670171e-04$	$-2.668034e-04$

$\mu = 0.1, p(\rho) = \rho^{1,4}$	
	tau= 0.001 ,h= 0.01
$h - h^1$	$9.091587e-04$
	$5.795505e-04$
	$5.009672e-02$
$h - h^2$	$8.620653e-04$
	$7.857459e-04$
	$5.012540e-02$
$h - h^3$	$7.995977e-04$
	$8.969821e-04$
	$5.016078e-02$

$\mu = 0.01, p(\rho) = \rho^{1.4}, h = 0.01, \tau = 0.001$				
	$n_{st}/4$	$n_{st}/2$	$3n_{st}/4$	$n_{st}, (2253.399)$
$norm$	$1.346128e-02$	$6.656399e-03$	$6.116539e-03$	$2.999672e-03$
Δ_{massa}	$-2.576410e-03$	$-2.573796e-03$	$-2.572480e-03$	$-2.574684e-03$

$\mu = 0.01, p(\rho) = \rho^{1,4}$	
	tau= 0.001 ,h= 0.01
$h - h^1$	$1.116737e-02$
	$8.405799e-03$
	$2.874337e-02$
$h - h^2$	$1.644330e-02$
	$1.266155e-02$
	$3.546773e-02$
$h - h^3$	$1.891122e-02$
	$1.477518e-02$
	$3.878311e-02$

$\mu = 0.001, p(\rho) = \rho^{1.4}, h = 0.01, \tau = 0.0001$				
	$n_{st}/4$	$n_{st}/2$	$3n_{st}/4$	$n_{st}, (3756.8286)$
$norm$	$9.356509e-03$	$5.124079e-03$	$3.691411e-03$	$2.999959e-03$
Δ_{massa}	$-2.468180e-03$	$-2.470134e-03$	$-2.470573e-03$	$-2.470738e-03$

$\mu = 0.001, p(\rho) = \rho^{1,4}$	
	tau= 0.0001 ,h= 0.01
$h - h^1$	$1.995535e-02$
	$9.129446e-03$
	$9.638065e-02$
$h - h^2$	$2.114815e-02$
	$1.131954e-02$
	$9.736638e-02$
$h - h^3$	$2.171822e-02$
	$1.248057e-02$
	$9.770504e-02$

Картинки

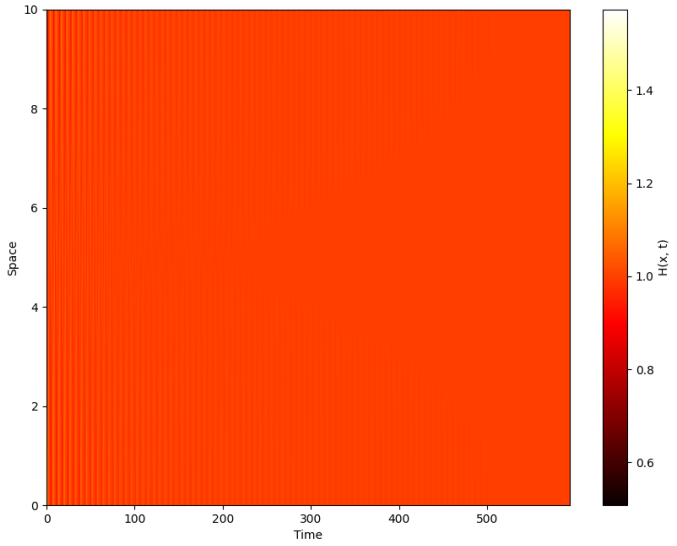

Figure 13: $\mu = 0.1, p(\rho) = 10\rho, h = 0.01, \tau = 0.01$, Плотность

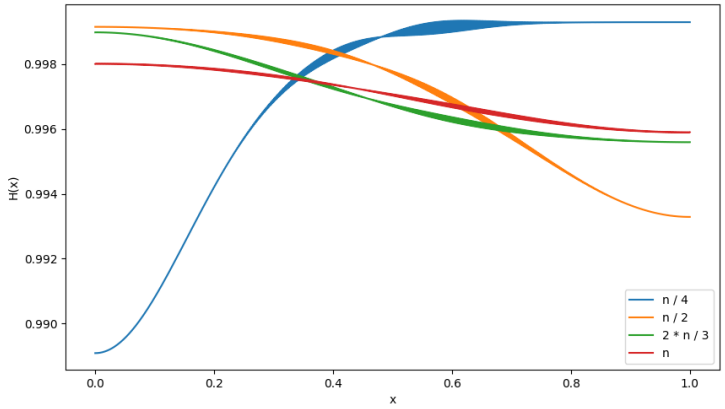

Figure 14: $\mu = 0.1, p(\rho) = 10\rho, h = 0.01, \tau = 0.01$, Плотность

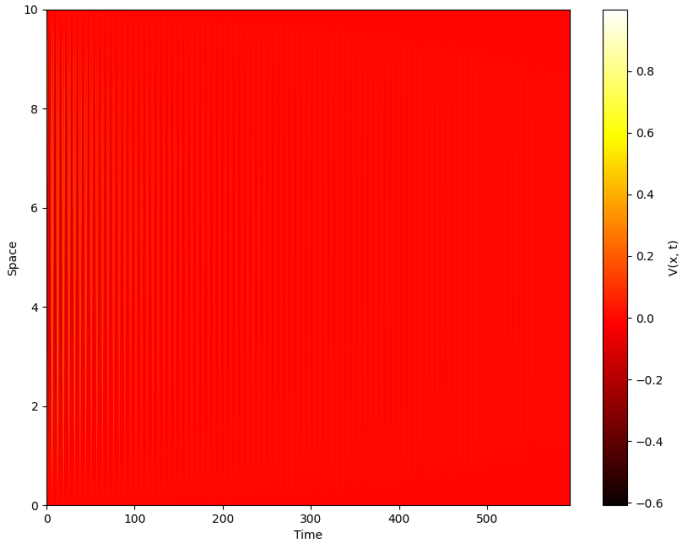

Figure 15: $\mu = 0.1, p(\rho) = 10\rho, h = 0.01, \tau = 0.01$, Скорость

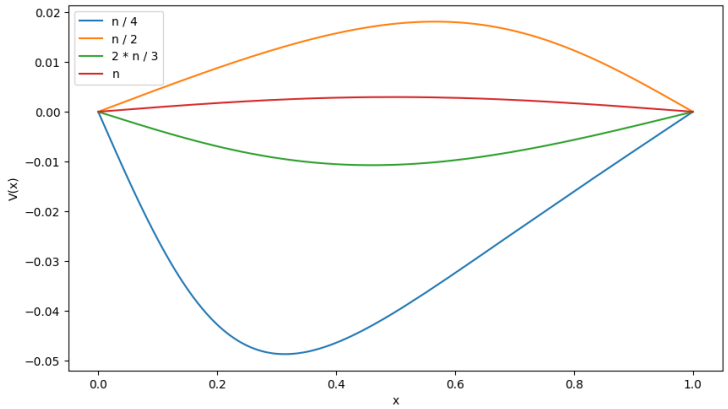

Figure 16: $\mu = 0.1, p(\rho) = 10\rho, h = 0.01, \tau = 0.01$, Скорость

Выводы

Наблюдается, что при уменьшении коэффициента вязкости процесс стабилизации протекает существенно медленнее. Также отмечается, что при увеличении коэффициента $C : p = C \cdot \rho$ длина цикла сокращается, а процесс стабилизации протекает быстрее. Также схема не является консервативной и изменение в массе соизмеримо с порядком аппроксимации.