1 Постановка задачи

Решается система дифференциальных уравнений

$$\frac{\partial \rho}{\partial t} + \frac{\partial \rho u}{\partial x} = 0 \tag{1}$$

$$\frac{\partial \rho u}{\partial t} + \frac{\partial \rho u^2}{\partial x} + \frac{\partial p}{\partial x} = \mu \frac{\partial^2 u}{\partial x^2} + \rho f \tag{2}$$

Для численного решения используется схема с центральными разностями $(\rho, \rho u)$ вида:

$$H_t + 0.5(V\hat{H}_{\mathring{x}} + (V\hat{H})_{\mathring{x}} + HV_{\mathring{x}}) = 0 \tag{3}$$

$$(HV)_t + \frac{2}{3}(\hat{H}V\hat{V})_{\mathring{x}} + \frac{2}{3}\hat{H}V\hat{V}_{\mathring{x}} + \frac{V^2}{3}\hat{H}_{\mathring{x}} + p(\hat{H})_{\mathring{x}} = \mu\hat{V}_{x\bar{x}} + \hat{H}f \tag{4}$$

С граничными условиями:

$$H_{t,0} + 0.5((V\hat{H})_{x,0} + H_0V_{x,0}) - 0.5h((HV)_{x\bar{x},1} - 0.5(HV)_{x,\bar{x},2} + H_0(V_{x\bar{x},1}) - 0.5V_{x\bar{x},2}) = 0 \tag{5}$$

$$H_{t,M} + 0.5((V\hat{H})_{\bar{x},M} + H_MV_{\bar{x},M}) + 0.5h((HV)_{x\bar{x},M-1}$$
$$-0.5(HV)_{x,\bar{x},M-2} + H_M(V_{x\bar{x},M-1}) - 0.5V_{x\bar{x},M-2}) = 0 \tag{6}$$

Расписанная схема имеет вид:

$$\frac{\tau}{4h}(V_m^n + V_{m+1}^n)H_{m+1}^{n+1} + H_m^{n+1} + \frac{\tau}{4h}(-V_m^n - V_{m-1}^n)H_{m-1}^{n+1} = H_m^n - \frac{\tau}{4h}H_m^n(V_{m+1}^n - V_{m-1}^n) \tag{7}$$

$$(\frac{\tau}{3h}H_{m+1}^{n+1}V_{m+1}^n + \frac{\tau}{3h}H_m^{n+1}V_m^n - \frac{\mu\tau}{h^2})V_{m+1}^{n+1} + (H_m^{n+1} + \frac{2\mu\tau}{h^2})V_m^{n+1}$$
$$+(-\frac{\tau}{3h}H_{m-1}^{n+1}V_{m-1}^n - \frac{\tau}{3h}H_m^{n+1}V_m^n - \frac{\mu\tau}{h^2})V_{m-1}^{n+1} = H_m^nV_m^n - \frac{\tau}{6h}(V_m^n)^2(H_{m+1}^{n+1} - H_{m-1}^{n+1})$$
$$-\frac{\tau}{2h}(p(H_{m+1}^{n+1} - p(H_{m-1}^{n+1}))) \tag{8}$$

2 Задание 1

Зададим функции давления и скорости:

$$\rho(t,x) = e^t(cos(3\pi x) + 1.5) \tag{9}$$

$$u(t,x) = cos(2\pi t)sin(4\pi x) \tag{10}$$

И вычислим правые части f_0 и f исходных уравнений:

```
inline double f_0(double t, double x)
{
    double dro_dt = std::exp(t) * (std::cos(3 * M_PI * x) + 1.5);
    double drou_dx = std::exp(t) * std::cos(2 * M_PI * t) *
    (4 * M_PI * std::cos(3 * M_PI * x) * std::cos(4 * M_PI * x) -
    3 * M_PI * std::sin(3 * M_PI * x) * std::sin(4 * M_PI * x)) +
    6 * M_PI * std::exp(t) * std::cos(2 * M_PI * t) * std::cos(4 * M_PI * x);
    return dro_dt + drou_dx;
}
```

В случае линейной зависимости давления от плотности:

```
inline double f_lin(double t, double x, double C, double mu)
{
    double ro = std::exp(t) * (std::cos(3 * M_PI * x) + 1.5);

    double drou_dt = (std::cos(3 * M_PI * x) * std::sin(4 * M_PI * x) +
    1.5 * std::sin(4 * M_PI * x)) *
    std::exp(t) * (std::cos(2 * M_PI * t) -
    2 * M_PI * std::sin(2 * M_PI * t));

    double drou2_dx = std::exp(t) * std::cos(2 * M_PI * t) *
    std::cos(2 * M_PI * t) *
    (-3 * M_PI * std::sin(3 * M_PI * x) *
    std::sin(4 * M_PI * x) * std::sin(4 * M_PI * x) +
    8 * M_PI * std::sin(4 * M_PI * x) *
    std::cos(4 * M_PI * x) * std::cos(3 * M_PI * x)) +
    12 * M_PI * std::exp(t) * std::cos(2 * M_PI * t) *
    std::cos(2 * M_PI * t) * std::sin(4 * M_PI * x) *
    std::cos(4 * M_PI * x);

    double d2u_dx2 = -1 * mu * 16 * M_PI * M_PI *
    std::cos(2 * M_PI * t) * std::sin(4 * M_PI * x);

    double dp_dx = C * std::exp(t) * (-3 * M_PI) * std::sin(3 * M_PI * x);

    return (drou_dt + drou2_dx + dp_dx - d2u_dx2) / ro;
}
```

В случай степенно зависимости давления от плотности

```
inline double f_pow(double t, double x, double gamma, double mu)
{
    double ro = std::exp(t) * (std::cos(3 * M_PI * x) + 1.5);

    double drou_dt = (std::cos(3 * M_PI * x) * std::sin(4 * M_PI * x) +
    1.5 * std::sin(4 * M_PI * x)) *
    std::exp(t) * (std::cos(2 * M_PI * t) -
    2 * M_PI * std::sin(2 * M_PI * t));

    double drou2_dx = std::exp(t) * std::cos(2 * M_PI * t) *
    std::cos(2 * M_PI * t) *
    (-3 * M_PI * std::sin(3 * M_PI * x) *
    std::sin(4 * M_PI * x) * std::sin(4 * M_PI * x) +
    8 * M_PI * std::sin(4 * M_PI * x) *
    std::cos(4 * M_PI * x) * std::cos(3 * M_PI * x)) +
    12 * M_PI * std::exp(t) * std::cos(2 * M_PI * t) *
    std::cos(2 * M_PI * t) * std::sin(4 * M_PI * x) *
    std::cos(4 * M_PI * x);

    double d2u_dx2 = -1 * mu * 16 * M_PI * M_PI *
    std::cos(2 * M_PI * t) * std::sin(4 * M_PI * x);

    double dp_dx = gamma * std::pow(std::exp(t) *
    (std::cos(3 * M_PI * x) + 1.5), gamma - 1) *
    std::exp(t) * (-3 * M_PI) * std::sin(3 * M_PI * x);

    return (drou_dt + drou2_dx + dp_dx - d2u_dx2) / ro;
}
```

2.1 Численные эксперименты

Обычный шаг сетки, плотность

$\mu = 0.1, p(\rho) = 1\rho$				
$\tau \setminus h$	0.1	0.01	0.001	0.0001
0.1	$1.479612e+02$	$3.545344e+02$	$6.742111e+02$	$2.835957e+03$
	$3.395492e+01$	$1.050477e+02$	$5.715137e+01$	$2.593582e+02$
	$4.570024e+02$	$5.326644e+03$	$9.345787e+04$	$2.439587e+06$
	$2.400000e-05$	$2.120000e-04$	$1.962000e-03$	$1.946400e-02$
0.01	$0.000000e+00$	$6.525722e-01$	$6.143926e-01$	$6.139451e-01$
	$-nan$	$2.022396e-01$	$1.958126e-01$	$1.957057e-01$
	$-nan$	$7.680877e+00$	$7.438442e+00$	$7.433561e+00$
	$1.810000e-04$	$1.877000e-03$	$1.812000e-02$	$1.796290e-01$
0.001	$0.000000e+00$	$5.108329e-02$	$6.413494e-02$	$6.427001e-02$
	$-nan$	$1.630812e-02$	$1.731402e-02$	$1.736038e-02$
	$-nan$	$5.832398e-01$	$5.876434e-01$	$5.884120e-01$
	$1.779000e-03$	$1.825500e-02$	$1.788490e-01$	$1.790802e+00$
0.0001	$0.000000e+00$	$2.419057e-02$	$6.425888e-03$	$6.563319e-03$
	$-nan$	$1.029436e-02$	$1.709786e-03$	$1.759136e-03$
	$-nan$	$2.738106e-01$	$5.768847e-02$	$5.855014e-02$
	$1.773900e-02$	$1.814030e-01$	$1.785686e+00$	$1.782749e+01$

$\mu = 0.01, p(\rho) = 1\rho$				
$\tau \setminus h$	0.1	0.01	0.001	0.0001
0.1	$1.689375e+75$	$1.294183e+05$	$1.452502e+29$	$1.230401e+23$
	$1.194566e+75$	$2.249596e+04$	$1.027074e+29$	$8.502810e+22$
	$1.693590e+76$	$3.184192e+06$	$1.452503e+32$	$1.202479e+27$
	$6.600000e-05$	$2.080000e-04$	$1.960000e-03$	$1.938900e-02$
0.01	$0.000000e+00$	$5.780942e+00$	$0.000000e+00$	$0.000000e+00$
	$-nan$	$1.548715e+00$	$-nan$	$-nan$
	$-nan$	$1.641333e+02$	$-nan$	$-nan$
	$5.240000e-04$	$2.283000e-03$	$1.904400e-02$	$1.795770e-01$
0.001	$0.000000e+00$	$4.655542e-01$	$7.270385e-01$	$7.306682e-01$
	$-nan$	$9.942960e-02$	$1.437217e-01$	$1.442355e-01$
	$-nan$	$6.712588e+00$	$8.345515e+00$	$8.368183e+00$
	$5.625000e-03$	$1.949600e-02$	$1.808870e-01$	$1.794873e+00$
0.0001	$0.000000e+00$	$2.206853e-01$	$6.536694e-02$	$6.837935e-02$
	$-nan$	$5.282039e-02$	$1.351189e-02$	$1.401443e-02$
	$-nan$	$3.026331e+00$	$7.341024e-01$	$7.524592e-01$
	$2.852800e-02$	$1.853180e-01$	$1.790224e+00$	$1.784584e+01$

$\mu = 0.001, p(\rho) = 1\rho$				
$\tau \setminus h$	0.1	0.01	0.001	0.0001
0.1	$2.043522e+42$	$0.000000e+00$	$0.000000e+00$	$0.000000e+00$
	$1.444989e+42$	$-nan$	$-nan$	$-nan$
	$2.048625e+43$	$-nan$	$-nan$	$-nan$
	$6.900000e-05$	$3.460000e-04$	$3.241000e-03$	$3.703100e-02$
0.01	$0.000000e+00$	$0.000000e+00$	$0.000000e+00$	$0.000000e+00$
	$-nan$	$-nan$	$-nan$	$-nan$
	$-nan$	$-nan$	$-nan$	$-nan$
	$5.410000e-04$	$3.101000e-03$	$2.985600e-02$	$3.068310e-01$
0.001	$0.000000e+00$	$1.358740e+00$	$2.943780e+00$	$0.000000e+00$
	$-nan$	$2.103964e-01$	$3.784003e-01$	$-nan$
	$-nan$	$2.806105e+01$	$1.209677e+02$	$-nan$
	$5.082000e-03$	$3.006800e-02$	$2.949820e-01$	$2.944399e+00$
0.0001	$0.000000e+00$	$1.066400e+00$	$2.712902e-01$	$2.685096e-01$
	$-nan$	$2.075186e-01$	$2.801289e-02$	$2.936044e-02$
	$-nan$	$2.151732e+01$	$5.493726e+00$	$5.659019e+00$
	$3.562600e-02$	$2.986890e-01$	$2.952293e+00$	$1.939693e+01$

$\mu = 0.1, p(\rho) = 10\rho$				
$\tau \setminus h$	0.1	0.01	0.001	0.0001
0.1	$2.179283e+09$	inf	$7.392997e+51$	$3.038886e+107$
	$1.804011e+09$	$-nan$	$5.227638e+51$	$2.147232e+107$
	$3.268447e+09$	$-nan$	$7.392999e+54$	$3.036645e+111$
	$2.500000e-05$	$2.090000e-04$	$1.961000e-03$	$1.940500e-02$
0.01	$2.241266e+00$	$0.000000e+00$	$0.000000e+00$	$0.000000e+00$
	$1.067949e+00$	$-nan$	$-nan$	$-nan$
	$1.713333e+01$	$-nan$	$-nan$	$-nan$
	$1.830000e-04$	$1.879000e-03$	$1.814500e-02$	$1.839330e-01$
0.001	$2.505101e+00$	$1.052819e-02$	$6.819746e-03$	$6.789148e-03$
	$1.196460e+00$	$4.519415e-03$	$3.399861e-03$	$3.391741e-03$
	$1.790488e+01$	$3.560847e-02$	$1.810001e-02$	$1.798926e-02$
	$1.762000e-03$	$1.838600e-02$	$1.789160e-01$	$1.832159e+00$
0.0001	$2.506552e+00$	$4.772559e-03$	$7.110225e-04$	$6.793548e-04$
	$1.234506e+00$	$2.015167e-03$	$3.481438e-04$	$3.396421e-04$
	$1.814316e+01$	$2.430710e-02$	$1.917962e-03$	$1.798243e-03$
	$1.768100e-02$	$1.814730e-01$	$1.786451e+00$	$1.815251e+01$

$\mu = 0.01, p(\rho) = 10\rho$				
$\tau \setminus h$	0.1	0.01	0.001	0.0001
0.1	inf	$0.000000e+00$	$0.000000e+00$	$0.000000e+00$
	$-nan$	$-nan$	$-nan$	$-nan$
	$-nan$	$-nan$	$-nan$	$-nan$
	$2.400000e-05$	$5.930000e-04$	$5.910000e-03$	$1.942300e-02$
0.01	$0.000000e+00$	$0.000000e+00$	$0.000000e+00$	$0.000000e+00$
	$-nan$	$-nan$	$-nan$	$-nan$
	$-nan$	$-nan$	$-nan$	$-nan$
	$2.010000e-04$	$1.866000e-03$	$1.809800e-02$	$1.913770e-01$
0.001	$0.000000e+00$	$8.905592e-03$	$0.000000e+00$	$0.000000e+00$
	$-nan$	$4.299584e-03$	$-nan$	$-nan$
	$-nan$	$3.793391e-02$	$-nan$	$-nan$
	$1.800000e-03$	$1.825100e-02$	$1.870870e-01$	$1.819435e+00$
0.0001	$0.000000e+00$	$4.151117e-03$	$5.750068e-04$	$5.462061e-04$
	$-nan$	$2.278634e-03$	$3.240186e-04$	$3.175811e-04$
	$-nan$	$2.907894e-02$	$1.677597e-03$	$1.541143e-03$
	$1.769200e-02$	$1.812890e-01$	$1.789208e+00$	$1.792852e+01$

$\mu = 0.001, p(\rho) = 10\rho$				
$\tau \setminus h$	0.1	0.01	0.001	0.0001
0.1	$2.810266e+112$	$0.000000e+00$	$0.000000e+00$	$0.000000e+00$
	$1.987128e+112$	$-nan$	$-nan$	$-nan$
	$2.817241e+113$	$-nan$	$-nan$	$-nan$
	$2.400000e-05$	$2.070000e-04$	$1.947000e-03$	$1.939500e-02$
0.01	$0.000000e+00$	$0.000000e+00$	$0.000000e+00$	$0.000000e+00$
	$-nan$	$-nan$	$-nan$	$-nan$
	$-nan$	$-nan$	$-nan$	$-nan$
	$1.810000e-04$	$1.883000e-03$	$1.812500e-02$	$1.802160e-01$
0.001	$0.000000e+00$	$1.209360e-02$	$0.000000e+00$	$0.000000e+00$
	$-nan$	$4.680033e-03$	$-nan$	$-nan$
	$-nan$	$1.431018e-01$	$-nan$	$-nan$
	$1.800000e-03$	$1.823600e-02$	$1.788120e-01$	$1.788167e+00$
0.0001	$0.000000e+00$	$5.670305e-03$	$6.267854e-04$	$0.000000e+00$
	$-nan$	$2.674859e-03$	$3.293832e-04$	$-nan$
	$-nan$	$3.978128e-02$	$1.739247e-03$	$-nan$
	$2.749300e-02$	$1.813940e-01$	$1.796037e+00$	$1.785268e+01$

$\mu = 0.1, p(\rho) = 100\rho$				
$\tau \setminus h$	0.1	0.01	0.001	0.0001
0.1	$3.960596e+103$	$0.000000e+00$	$0.000000e+00$	$0.000000e+00$
	$2.800564e+103$	$-nan$	$-nan$	$-nan$
	$3.970485e+104$	$-nan$	$-nan$	$-nan$
	$2.400000e-05$	$2.240000e-04$	$1.964000e-03$	$1.944900e-02$
0.01	$0.000000e+00$	$0.000000e+00$	$0.000000e+00$	$0.000000e+00$
	$-nan$	$-nan$	$-nan$	$-nan$
	$-nan$	$-nan$	$-nan$	$-nan$
	$1.840000e-04$	$1.882000e-03$	$1.811400e-02$	$1.796000e-01$
0.001	$0.000000e+00$	$8.674660e-03$	$0.000000e+00$	$0.000000e+00$
	$-nan$	$4.574784e-03$	$-nan$	$-nan$
	$-nan$	$3.558935e-02$	$-nan$	$-nan$
	$1.781000e-03$	$1.842400e-02$	$1.789140e-01$	$1.783111e+00$
0.0001	$0.000000e+00$	$4.459118e-03$	$5.090780e-04$	$4.700053e-04$
	$-nan$	$2.482966e-03$	$3.184410e-04$	$3.081752e-04$
	$-nan$	$2.497492e-02$	$1.487139e-03$	$1.275499e-03$
	$1.772600e-02$	$1.816870e-01$	$1.790525e+00$	$1.801275e+01$

$\mu = 0.01, p(\rho) = 100\rho$				
$\tau \setminus h$	0.1	0.01	0.001	0.0001
0.1	$0.000000e+00$	$0.000000e+00$	$0.000000e+00$	$0.000000e+00$
	$-nan$	$-nan$	$-nan$	$-nan$
	$-nan$	$-nan$	$-nan$	$-nan$
	$2.700000e-05$	$4.780000e-04$	$1.947000e-03$	$1.943000e-02$
0.01	$0.000000e+00$	$0.000000e+00$	$0.000000e+00$	$0.000000e+00$
	$-nan$	$-nan$	$-nan$	$-nan$
	$-nan$	$-nan$	$-nan$	$-nan$
	$1.810000e-04$	$5.368000e-03$	$1.815400e-02$	$1.795170e-01$
0.001	$0.000000e+00$	$8.503219e-03$	$0.000000e+00$	$0.000000e+00$
	$-nan$	$4.514944e-03$	$-nan$	$-nan$
	$-nan$	$3.476676e-02$	$-nan$	$-nan$
	$1.765000e-03$	$2.799300e-02$	$1.789590e-01$	$1.786499e+00$
0.0001	$0.000000e+00$	$4.443286e-03$	$5.093738e-04$	$0.000000e+00$
	$-nan$	$2.486366e-03$	$3.182235e-04$	$-nan$
	$-nan$	$2.497838e-02$	$1.482229e-03$	$-nan$
	$1.766300e-02$	$1.815600e-01$	$1.786541e+00$	$1.781044e+01$

$\mu = 0.001, p(\rho) = 100\rho$				
$\tau \setminus h$	0.1	0.01	0.001	0.0001
0.1	$0.000000e+00$	$0.000000e+00$	$0.000000e+00$	$0.000000e+00$
	$-nan$	$-nan$	$-nan$	$-nan$
	$-nan$	$-nan$	$-nan$	$-nan$
	$2.500000e-05$	$2.200000e-04$	$1.962000e-03$	$1.939600e-02$
0.01	$0.000000e+00$	$0.000000e+00$	$0.000000e+00$	$0.000000e+00$
	$-nan$	$-nan$	$-nan$	$-nan$
	$-nan$	$-nan$	$-nan$	$-nan$
	$1.810000e-04$	$1.872000e-03$	$1.851600e-02$	$1.795050e-01$
0.001	$0.000000e+00$	$0.000000e+00$	$0.000000e+00$	$0.000000e+00$
	$-nan$	$-nan$	$-nan$	$-nan$
	$-nan$	$-nan$	$-nan$	$-nan$
	$1.780000e-03$	$1.823100e-02$	$1.816770e-01$	$1.792104e+00$
0.0001	$0.000000e+00$	$4.453419e-03$	$0.000000e+00$	$0.000000e+00$
	$-nan$	$2.482664e-03$	$-nan$	$-nan$
	$-nan$	$2.799643e-02$	$-nan$	$-nan$
	$1.772700e-02$	$1.823180e-01$	$1.820247e+00$	$1.780319e+01$

$\mu = 0.1, p(\rho) = \rho^{1.4}$				
$\tau \setminus h$	0.1	0.01	0.001	0.0001
0.1	$0.000000e+00$	$0.000000e+00$	$0.000000e+00$	$0.000000e+00$
	$-nan$	$-nan$	$-nan$	$-nan$
	$-nan$	$-nan$	$-nan$	$-nan$
	$3.100000e-05$	$2.560000e-04$	$2.450000e-03$	$2.423200e-02$
0.01	$0.000000e+00$	$3.458994e-01$	$3.419444e-01$	$3.419118e-01$
	$-nan$	$1.436457e-01$	$1.419179e-01$	$1.419033e-01$
	$-nan$	$2.718655e+00$	$2.676938e+00$	$2.676276e+00$
	$2.250000e-04$	$2.431000e-03$	$2.374800e-02$	$2.356480e-01$
0.001	$0.000000e+00$	$4.136405e-02$	$3.285604e-02$	$3.280274e-02$
	$-nan$	$1.638657e-02$	$1.384925e-02$	$1.383192e-02$
	$-nan$	$3.162398e-01$	$2.472530e-01$	$2.468246e-01$
	$2.177000e-03$	$2.375200e-02$	$2.348980e-01$	$2.339907e+00$
0.0001	$0.000000e+00$	$1.440330e-02$	$3.305485e-03$	$3.249649e-03$
	$-nan$	$5.907827e-03$	$1.394517e-03$	$1.376649e-03$
	$-nan$	$1.422563e-01$	$2.488637e-02$	$2.444323e-02$
	$2.191700e-02$	$2.363970e-01$	$2.347709e+00$	$2.337273e+01$

$\mu = 0.01, p(\rho) = \rho^{1.4}$				
$\tau \setminus h$	0.1	0.01	0.001	0.0001
0.1	$0.000000e+00$	$0.000000e+00$	$0.000000e+00$	$0.000000e+00$
	$-nan$	$-nan$	$-nan$	$-nan$
	$-nan$	$-nan$	$-nan$	$-nan$
	$3.400000e-05$	$2.550000e-04$	$2.410000e-03$	$2.400900e-02$
0.01	$0.000000e+00$	$0.000000e+00$	$0.000000e+00$	$0.000000e+00$
	$-nan$	$-nan$	$-nan$	$-nan$
	$-nan$	$-nan$	$-nan$	$-nan$
	$2.280000e-04$	$2.410000e-03$	$2.236200e-02$	$2.207160e-01$
0.001	$0.000000e+00$	$3.763576e-02$	$2.849158e-02$	$2.852086e-02$
	$-nan$	$1.648619e-02$	$1.281607e-02$	$1.280572e-02$
	$-nan$	$4.067476e-01$	$2.705524e-01$	$2.702514e-01$
	$2.189000e-03$	$2.372200e-02$	$2.347160e-01$	$2.339734e+00$
0.0001	$0.000000e+00$	$2.171814e-02$	$2.704533e-03$	$2.730692e-03$
	$-nan$	$8.993833e-03$	$1.253981e-03$	$1.243950e-03$
	$-nan$	$2.635254e-01$	$2.600322e-02$	$2.576084e-02$
	$2.179600e-02$	$2.362690e-01$	$2.346283e+00$	$2.337924e+01$

$\mu = 0.001, p(\rho) = \rho^{1.4}$				
$\tau \setminus h$	0.1	0.01	0.001	0.0001
0.1	$0.000000e+00$	$0.000000e+00$	$0.000000e+00$	$0.000000e+00$
	$-nan$	$-nan$	$-nan$	$-nan$
	$-nan$	$-nan$	$-nan$	$-nan$
	$3.500000e-05$	$2.580000e-04$	$2.419000e-03$	$2.397400e-02$
0.01	$0.000000e+00$	$0.000000e+00$	$0.000000e+00$	$0.000000e+00$
	$-nan$	$-nan$	$-nan$	$-nan$
	$-nan$	$-nan$	$-nan$	$-nan$
	$2.220000e-04$	$2.348000e-03$	$2.236400e-02$	$2.240680e-01$
0.001	$0.000000e+00$	$7.939126e-02$	$0.000000e+00$	$0.000000e+00$
	$-nan$	$2.877219e-02$	$-nan$	$-nan$
	$-nan$	$3.627594e+00$	$-nan$	$-nan$
	$2.169000e-03$	$2.380000e-02$	$2.327400e-01$	$2.176548e+00$
0.0001	$0.000000e+00$	$5.098108e-02$	$2.548109e-03$	$2.656378e-03$
	$-nan$	$1.766025e-02$	$1.233000e-03$	$1.238167e-03$
	$-nan$	$1.683553e+00$	$2.969702e-02$	$2.974066e-02$
	$2.174300e-02$	$2.364780e-01$	$2.352005e+00$	$2.338083e+01$

Измелченный шаг сетки, плотность

$\mu = 0.1, p(\rho) = 1\rho$						
$\tau \setminus h$	0.005	0.0025	0.00125	0.000625	0.0003125	0.00015625
0.005	$2.893845e-01$	$2.915237e-01$	$2.913509e-01$	$2.913015e-01$	$2.913385e-01$	$2.913374e-01$
	$8.611497e-02$	$8.622999e-02$	$8.623645e-02$	$8.623747e-02$	$8.623915e-02$	$8.623975e-02$
	$3.137688e+00$	$3.131871e+00$	$3.129518e+00$	$3.128874e+00$	$3.128766e+00$	$3.128744e+00$
	$7.407000e-03$	$1.487000e-02$	$2.914100e-02$	$5.815800e-02$	$1.157880e-01$	$2.318680e-01$
0.0025	$1.524219e-01$	$1.543208e-01$	$1.547432e-01$	$1.549055e-01$	$1.549308e-01$	$1.549417e-01$
	$4.202855e-02$	$4.260850e-02$	$4.275977e-02$	$4.279980e-02$	$4.281009e-02$	$4.281264e-02$
	$1.483760e+00$	$1.490807e+00$	$1.492612e+00$	$1.493119e+00$	$1.493253e+00$	$1.493286e+00$
	$1.476000e-02$	$2.921000e-02$	$5.818000e-02$	$1.157410e-01$	$2.311380e-01$	$4.626090e-01$
0.00125	$7.691631e-02$	$7.913400e-02$	$7.966958e-02$	$7.980628e-02$	$7.984871e-02$	$7.985736e-02$
	$2.066607e-02$	$2.136305e-02$	$2.156384e-02$	$2.161647e-02$	$2.162970e-02$	$2.163300e-02$
	$7.220191e-01$	$7.325832e-01$	$7.357691e-01$	$7.366206e-01$	$7.368342e-01$	$7.368874e-01$
	$2.937800e-02$	$5.823900e-02$	$1.160410e-01$	$2.312140e-01$	$4.619780e-01$	$9.264950e-01$
0.000625	$3.733308e-02$	$3.972090e-02$	$4.030919e-02$	$4.047760e-02$	$4.051570e-02$	$4.052520e-02$
	$9.988930e-03$	$1.061650e-02$	$1.083062e-02$	$1.088772e-02$	$1.090215e-02$	$1.090576e-02$
	$3.524930e-01$	$3.620059e-01$	$3.655893e-01$	$3.665641e-01$	$3.668107e-01$	$3.668725e-01$
	$5.863100e-02$	$1.163470e-01$	$2.317190e-01$	$4.624440e-01$	$9.230660e-01$	$1.846046e+00$
0.0003125	$1.710448e-02$	$1.957835e-02$	$2.019278e-02$	$2.036015e-02$	$2.039974e-02$	$2.041011e-02$
	$4.860735e-03$	$5.194855e-03$	$5.401525e-03$	$5.459803e-03$	$5.474727e-03$	$5.478480e-03$
	$1.745043e-01$	$1.783389e-01$	$1.817985e-01$	$1.828096e-01$	$1.830702e-01$	$1.831359e-01$
	$1.171520e-01$	$2.324070e-01$	$4.710840e-01$	$9.240540e-01$	$1.852106e+00$	$3.692200e+00$
0.00015625	$7.498453e-03$	$9.400183e-03$	$1.002532e-02$	$1.018984e-02$	$1.023049e-02$	$1.024057e-02$
	$2.823541e-03$	$2.494873e-03$	$2.669442e-03$	$2.726722e-03$	$2.741789e-03$	$2.745601e-03$
	$9.624038e-02$	$8.738025e-02$	$9.017108e-02$	$9.116381e-02$	$9.142896e-02$	$9.149631e-02$
	$2.341350e-01$	$4.651290e-01$	$9.357880e-01$	$1.846729e+00$	$3.734593e+00$	$7.423286e+00$

$\mu = 0.01, p(\rho) = 1\rho$						
$\tau \setminus h$	0.005	0.0025	0.00125	0.000625	0.0003125	0.00015625
0.005	$4.900888e+00$	$5.133649e+00$	$5.604197e+00$	$5.981867e+00$	$2.363684e+10$	$2.299583e+09$
	$7.799330e-01$	$7.761854e-01$	$7.659045e-01$	$7.751129e-01$	$8.904598e+08$	$1.176841e+08$
	$8.058803e+01$	$9.244111e+01$	$1.213865e+02$	$3.685580e+02$	$4.015233e+12$	$1.063727e+12$
	$7.417000e-03$	$1.463800e-02$	$2.910300e-02$	$5.809800e-02$	$1.271220e-01$	$2.331790e-01$
0.0025	$1.929420e+00$	$1.990965e+00$	$2.006569e+00$	$2.007622e+00$	$2.008172e+00$	$2.008361e+00$
	$3.631623e-01$	$3.718577e-01$	$3.740268e-01$	$3.745687e-01$	$3.747041e-01$	$3.747380e-01$
	$2.510589e+01$	$2.578269e+01$	$2.596047e+01$	$2.600609e+01$	$2.601758e+01$	$2.602046e+01$
	$1.473900e-02$	$2.951600e-02$	$5.800400e-02$	$1.229880e-01$	$2.557010e-01$	$4.616250e-01$
0.00125	$8.367617e-01$	$9.074929e-01$	$9.228006e-01$	$9.275400e-01$	$9.285267e-01$	$9.287728e-01$
	$1.688927e-01$	$1.783897e-01$	$1.808039e-01$	$1.814097e-01$	$1.815613e-01$	$1.815992e-01$
	$1.022621e+01$	$1.065398e+01$	$1.076655e+01$	$1.079507e+01$	$1.080222e+01$	$1.080401e+01$
	$2.934500e-02$	$5.819200e-02$	$1.161320e-01$	$2.417220e-01$	$4.806590e-01$	$9.331000e-01$
0.000625	$3.573832e-01$	$4.231343e-01$	$4.396450e-01$	$4.434951e-01$	$4.444552e-01$	$4.447130e-01$
	$7.670919e-02$	$8.591451e-02$	$8.831782e-02$	$8.892395e-02$	$8.907580e-02$	$8.911379e-02$
	$4.531714e+00$	$4.866648e+00$	$4.961996e+00$	$4.986508e+00$	$4.992677e+00$	$4.994222e+00$
	$5.853700e-02$	$1.161800e-01$	$2.315130e-01$	$4.676090e-01$	$9.246050e-01$	$1.860994e+00$
0.0003125	$1.388926e-01$	$1.970203e-01$	$2.123008e-01$	$2.160633e-01$	$2.169896e-01$	$2.172297e-01$
	$3.255612e-02$	$4.096086e-02$	$4.331812e-02$	$4.391886e-02$	$4.406971e-02$	$4.410746e-02$
	$2.046380e+00$	$2.291703e+00$	$2.377804e+00$	$2.400630e+00$	$2.406414e+00$	$2.407865e+00$
	$1.279320e-01$	$2.326540e-01$	$4.740430e-01$	$9.290540e-01$	$1.858447e+00$	$3.705711e+00$
0.00015625	$8.227427e-02$	$8.819948e-02$	$1.024888e-01$	$1.061607e-01$	$1.070592e-01$	$1.072839e-01$
	$1.293381e-02$	$1.887575e-02$	$2.115212e-02$	$2.174663e-02$	$2.189661e-02$	$2.193419e-02$
	$9.978122e-01$	$1.077601e+00$	$1.154051e+00$	$1.175836e+00$	$1.181434e+00$	$1.182842e+00$
	$2.337100e-01$	$4.761070e-01$	$9.252340e-01$	$1.852444e+00$	$3.689680e+00$	$7.388481e+00$

$\mu = 0.001, p(\rho) = 1\rho$						
$\tau \setminus h$	0.005	0.0025	0.00125	0.000625	0.0003125	0.00015625
0.005	$0.000000e+00$	$0.000000e+00$	$0.000000e+00$	$0.000000e+00$	$0.000000e+00$	$0.000000e+00$
	$-nan$	$-nan$	nan	$-nan$	$-nan$	nan
	$-nan$	$-nan$	nan	$-nan$	$-nan$	nan
	$1.867200e-02$	$2.443300e-02$	$4.807400e-02$	$9.570900e-02$	$1.218770e-01$	$2.403440e-01$
0.0025	$7.054475e+00$	$0.000000e+00$	$0.000000e+00$	$0.000000e+00$	$0.000000e+00$	$0.000000e+00$
	$1.272566e+00$	nan	nan	$-nan$	nan	nan
	$3.913050e+02$	nan	nan	$-nan$	nan	nan
	$2.434300e-02$	$4.807900e-02$	$9.575400e-02$	$1.908370e-01$	$2.317490e-01$	$4.713370e-01$
0.00125	$2.564928e+00$	$3.857608e+00$	$6.197531e+00$	$6.093398e+00$	$0.000000e+00$	$0.000000e+00$
	$3.803479e-01$	$4.227302e-01$	$6.064705e-01$	$1.902754e+00$	$-nan$	$-nan$
	$8.464561e+01$	$1.810421e+02$	$3.853700e+02$	$5.101565e+02$	$-nan$	$-nan$
	$4.857800e-02$	$9.697500e-02$	$1.914690e-01$	$3.812200e-01$	$4.617600e-01$	$9.231580e-01$
0.000625	$1.419521e+00$	$2.216273e+00$	$1.726352e+00$	$1.039263e+00$	$1.020661e+00$	$0.000000e+00$
	$1.741238e-01$	$1.796006e-01$	$1.566479e-01$	$1.331874e-01$	$1.377094e-01$	$-nan$
	$3.484272e+01$	$5.115149e+01$	$6.773710e+01$	$3.161886e+01$	$3.094928e+01$	$-nan$
	$9.678000e-02$	$1.918480e-01$	$3.828750e-01$	$7.618870e-01$	$9.278520e-01$	$1.869128e+00$
0.0003125	$6.877637e-01$	$9.627884e-01$	$9.843942e-01$	$8.376073e-01$	$7.923757e-01$	$7.828591e-01$
	$7.852395e-02$	$8.556558e-02$	$8.595773e-02$	$8.565856e-02$	$8.570666e-02$	$8.572498e-02$
	$1.596951e+01$	$1.935555e+01$	$2.256076e+01$	$2.207361e+01$	$2.177715e+01$	$2.170835e+01$
	$1.930050e-01$	$3.830890e-01$	$7.640110e-01$	$1.524760e+00$	$1.847773e+00$	$3.690688e+00$
0.00015625	$3.794978e-01$	$4.203847e-01$	$4.428989e-01$	$4.227906e-01$	$4.185418e-01$	$4.174648e-01$
	$4.937137e-02$	$3.918362e-02$	$4.355501e-02$	$4.488731e-02$	$4.523790e-02$	$4.532674e-02$
	$9.650137e+00$	$8.248641e+00$	$9.051167e+00$	$9.249589e+00$	$9.292250e+00$	$9.302605e+00$
	$3.859240e-01$	$7.835370e-01$	$1.534377e+00$	$2.812675e+00$	$3.699041e+00$	$7.386080e+00$

$\mu = 0.1, p(\rho) = 10\rho$						
$\tau \setminus h$	0.005	0.0025	0.00125	0.000625	0.0003125	0.00015625
0.005	$3.470153e-02$	$4.027325e-02$	$5.609978e+06$	$1.312251e+09$	$2.278166e+29$	$1.270990e+101$
	$1.707447e-02$	$1.698463e-02$	$1.135779e+06$	$2.292786e+08$	$6.143380e+27$	$4.612069e+100$
	$9.329289e-02$	$5.473767e-01$	$1.668156e+08$	$1.646350e+10$	$2.803154e+31$	$4.174368e+104$
	$7.434000e-03$	$1.483100e-02$	$2.914000e-02$	$5.816100e-02$	$1.158330e-01$	$2.315760e-01$
0.0025	$1.777109e-02$	$1.716100e-02$	$1.701379e-02$	$1.697756e-02$	$1.696851e-02$	$1.696625e-02$
	$8.674932e-03$	$8.513864e-03$	$8.475284e-03$	$8.465746e-03$	$8.463368e-03$	$8.462774e-03$
	$4.809207e-02$	$4.575653e-02$	$4.521750e-02$	$4.508570e-02$	$4.505294e-02$	$4.504476e-02$
	$1.478900e-02$	$2.927800e-02$	$5.808800e-02$	$1.158190e-01$	$2.311240e-01$	$4.626720e-01$
0.00125	$9.314353e-03$	$8.682180e-03$	$8.533851e-03$	$8.497537e-03$	$8.488502e-03$	$8.486244e-03$
	$4.460908e-03$	$4.290377e-03$	$4.251016e-03$	$4.241390e-03$	$4.238996e-03$	$4.238399e-03$
	$2.575681e-02$	$2.321783e-02$	$2.266651e-02$	$2.253454e-02$	$2.250193e-02$	$2.249380e-02$
	$2.945500e-02$	$5.836000e-02$	$1.162190e-01$	$2.314260e-01$	$4.642230e-01$	$9.255960e-01$
0.000625	$5.111654e-03$	$4.443472e-03$	$4.292020e-03$	$4.255482e-03$	$4.246453e-03$	$4.244198e-03$
	$2.361180e-03$	$2.174334e-03$	$2.133745e-03$	$2.124019e-03$	$2.121615e-03$	$2.121015e-03$
	$1.487860e-02$	$1.199482e-02$	$1.141523e-02$	$1.128166e-02$	$1.124902e-02$	$1.124091e-02$
	$5.870700e-02$	$1.256800e-01$	$2.326680e-01$	$4.621770e-01$	$9.229790e-01$	$1.854221e+00$
0.0003125	$3.039179e-03$	$2.328490e-03$	$2.170933e-03$	$2.133966e-03$	$2.124906e-03$	$2.122652e-03$
	$1.330538e-03$	$1.116735e-03$	$1.073935e-03$	$1.064053e-03$	$1.061636e-03$	$1.061035e-03$
	$9.775877e-03$	$6.430955e-03$	$5.798238e-03$	$5.660945e-03$	$5.628101e-03$	$5.619986e-03$
	$1.176900e-01$	$2.325720e-01$	$4.672030e-01$	$9.239240e-01$	$1.846479e+00$	$3.691511e+00$
0.00015625	$2.022007e-03$	$1.277785e-03$	$1.110956e-03$	$1.073117e-03$	$1.064001e-03$	$1.061746e-03$
	$8.424085e-04$	$5.907288e-04$	$5.439327e-04$	$5.337635e-04$	$5.313269e-04$	$5.307245e-04$
	$7.510906e-03$	$3.716549e-03$	$2.997016e-03$	$2.852353e-03$	$2.819031e-03$	$2.810890e-03$
	$2.342660e-01$	$4.748030e-01$	$9.263840e-01$	$1.848054e+00$	$3.693649e+00$	$7.383658e+00$

$\mu = 0.01, p(\rho) = 10\rho$						
$\tau \setminus h$	0.005	0.0025	0.00125	0.000625	0.0003125	0.00015625
0.005	$0.000000e+00$	$0.000000e+00$	$0.000000e+00$	$0.000000e+00$	$0.000000e+00$	$0.000000e+00$
	nan	$-nan$	nan	nan	nan	nan
	nan	$-nan$	nan	nan	nan	nan
	$7.439000e-03$	$1.470000e-02$	$2.918800e-02$	$5.805700e-02$	$1.160020e-01$	$2.332330e-01$
0.0025	$1.447342e-02$	$0.000000e+00$	$0.000000e+00$	$0.000000e+00$	$0.000000e+00$	$0.000000e+00$
	$8.086155e-03$	nan	nan	nan	nan	nan
	$4.273009e-02$	nan	nan	nan	nan	nan
	$1.478700e-02$	$2.923400e-02$	$5.811500e-02$	$1.244220e-01$	$2.313330e-01$	$4.616980e-01$
0.00125	$7.618541e-03$	$7.017173e-03$	$0.000000e+00$	$0.000000e+00$	$0.000000e+00$	$0.000000e+00$
	$4.144107e-03$	$4.004375e-03$	nan	nan	nan	nan
	$2.334309e-02$	$2.020443e-02$	nan	nan	nan	nan
	$3.214200e-02$	$5.830400e-02$	$1.164190e-01$	$2.410050e-01$	$4.624120e-01$	$9.353200e-01$
0.000625	$4.238767e-03$	$3.598201e-03$	$3.458471e-03$	$0.000000e+00$	$0.000000e+00$	$0.000000e+00$
	$2.192574e-03$	$2.024360e-03$	$1.993195e-03$	$-nan$	$-nan$	nan
	$1.421848e-02$	$1.052328e-02$	$9.849092e-03$	$-nan$	$-nan$	nan
	$5.868300e-02$	$1.164040e-01$	$2.318090e-01$	$4.722120e-01$	$9.238610e-01$	$1.861632e+00$
0.0003125	$2.573644e-03$	$1.899704e-03$	$1.750393e-03$	$1.717285e-03$	$1.709393e-03$	$1.707448e-03$
	$1.252290e-03$	$1.036750e-03$	$1.001742e-03$	$9.944316e-04$	$9.926978e-04$	$9.922703e-04$
	$1.014084e-02$	$5.788703e-03$	$5.019055e-03$	$4.865621e-03$	$4.830143e-03$	$4.821461e-03$
	$1.174780e-01$	$2.337210e-01$	$4.641840e-01$	$9.349300e-01$	$1.880127e+00$	$3.721943e+00$
0.00015625	$1.748549e-03$	$1.058703e-03$	$8.985621e-04$	$8.637468e-04$	$8.557285e-04$	$8.537762e-04$
	$8.280625e-04$	$5.483113e-04$	$5.062590e-04$	$4.984515e-04$	$4.966845e-04$	$4.962545e-04$
	$8.420904e-03$	$3.537173e-03$	$2.622240e-03$	$2.454994e-03$	$2.418613e-03$	$2.409885e-03$
	$2.342320e-01$	$4.658310e-01$	$9.261650e-01$	$1.868094e+00$	$3.735896e+00$	$7.422385e+00$

$\mu = 0.001, p(\rho) = 10\rho$						
$\tau \setminus h$	0.005	0.0025	0.00125	0.000625	0.0003125	0.00015625
0.005	$0.000000e+00$ $-nan$ $-nan$ $7.415000e-03$	$0.000000e+00$ nan nan $1.471200e-02$	$0.000000e+00$ $-nan$ $-nan$ $2.917400e-02$	$0.000000e+00$ nan nan $5.801400e-02$	$0.000000e+00$ $-nan$ $-nan$ $1.158030e-01$	$0.000000e+00$ nan nan $2.319420e-01$
0.0025	$0.000000e+00$ nan nan $1.478000e-02$	$0.000000e+00$ $-nan$ $-nan$ $2.922900e-02$	$0.000000e+00$ $-nan$ $-nan$ $5.809700e-02$	$0.000000e+00$ $-nan$ $-nan$ $1.169840e-01$	$0.000000e+00$ nan nan $2.311160e-01$	$0.000000e+00$ $-nan$ $-nan$ $4.629510e-01$
0.00125	$0.000000e+00$ $-nan$ $-nan$ $2.987100e-02$	$0.000000e+00$ nan nan $5.827000e-02$	$0.000000e+00$ nan nan $1.159390e-01$	$0.000000e+00$ $-nan$ $-nan$ $2.419660e-01$	$0.000000e+00$ nan nan $4.621510e-01$	$0.000000e+00$ $-nan$ $-nan$ $9.237800e-01$
0.000625	$4.804786e-03$ $2.244008e-03$ $1.552917e-02$ $5.870300e-02$	$0.000000e+00$ $-nan$ $-nan$ $1.164210e-01$	$0.000000e+00$ nan nan $2.322940e-01$	$0.000000e+00$ $-nan$ $-nan$ $4.629840e-01$	$0.000000e+00$ $-nan$ $-nan$ $9.238000e-01$	$0.000000e+00$ nan nan $1.855162e+00$
0.0003125	$2.989562e-03$ $1.303740e-03$ $1.149007e-02$ $1.175890e-01$	$2.095558e-03$ $1.054842e-03$ $6.072177e-03$ $2.324700e-01$	$0.000000e+00$ $-nan$ $-nan$ $4.636670e-01$	$0.000000e+00$ $-nan$ $-nan$ $9.242390e-01$	$0.000000e+00$ nan nan $1.847257e+00$	$0.000000e+00$ $-nan$ $-nan$ $3.695794e+00$
0.00015625	$2.087142e-03$ $8.908657e-04$ $9.827234e-03$ $2.346110e-01$	$1.186917e-03$ $5.604874e-04$ $3.797889e-03$ $4.654460e-01$	$9.794936e-04$ $5.146432e-04$ $2.719082e-03$ $9.268990e-01$	$9.309543e-04$ $5.073829e-04$ $4.829216e-02$ $1.847471e+00$	$4.063144e+00$ $2.123764e+00$ $4.842522e+02$ $3.695550e+00$	$0.000000e+00$ $-nan$ $-nan$ $7.389896e+00$

$\mu = 0.1, p(\rho) = 100\rho$						
$\tau \setminus h$	0.005	0.0025	0.00125	0.000625	0.0003125	0.00015625
0.005	$0.000000e+00$ $-nan$ $-nan$ $7.429000e-03$	$0.000000e+00$ nan nan $1.467000e-02$	$0.000000e+00$ nan nan $2.915400e-02$	$0.000000e+00$ $-nan$ $-nan$ $5.800300e-02$	$0.000000e+00$ $-nan$ $-nan$ $1.158500e-01$	$0.000000e+00$ nan nan $2.314530e-01$
0.0025	$0.000000e+00$ nan nan $1.476100e-02$	$0.000000e+00$ $-nan$ $-nan$ $2.927700e-02$	$0.000000e+00$ nan nan $5.808600e-02$	$0.000000e+00$ nan nan $1.159690e-01$	$0.000000e+00$ nan nan $2.311340e-01$	$0.000000e+00$ $-nan$ $-nan$ $4.622800e-01$
0.00125	$8.204304e+00$ $2.358930e+00$ $4.319501e+02$ $2.939800e-02$	$0.000000e+00$ nan nan $5.825500e-02$	$0.000000e+00$ nan nan $1.160600e-01$	$0.000000e+00$ $-nan$ $-nan$ $2.315200e-01$	$0.000000e+00$ $-nan$ $-nan$ $4.621620e-01$	$0.000000e+00$ nan nan $9.234320e-01$
0.000625	$3.926593e-03$ $2.231145e-03$ $1.349392e-02$ $5.864200e-02$	$4.352413e+00$ $3.236816e-01$ $1.420743e+02$ $1.163990e-01$	$0.000000e+00$ nan nan $2.317330e-01$	$0.000000e+00$ nan nan $4.619150e-01$	$0.000000e+00$ nan nan $9.275290e-01$	$0.000000e+00$ $-nan$ $-nan$ $1.845479e+00$
0.0003125	$2.461054e-03$ $1.316312e-03$ $9.633628e-03$ $1.171160e-01$	$1.714661e-03$ $1.031651e-03$ $5.335081e-03$ $2.326350e-01$	$1.529123e-03$ $9.783640e-04$ $4.310425e-03$ $4.630930e-01$	$1.482896e-03$ $9.665211e-04$ $4.061458e-03$ $9.239220e-01$	$1.471353e-03$ $9.636590e-04$ $3.999812e-03$ $1.845893e+00$	$1.468469e-03$ $9.629497e-04$ $3.984441e-03$ $3.702063e+00$
0.00015625	$1.728140e-03$ $8.971344e-04$ $7.748414e-03$ $2.361940e-01$	$9.813768e-04$ $5.577447e-04$ $3.371825e-03$ $4.647520e-01$	$7.954354e-04$ $4.975614e-04$ $2.323685e-03$ $9.261820e-01$	$7.491536e-04$ $4.852107e-04$ $2.072023e-03$ $1.848197e+00$	$7.376099e-04$ $4.823159e-04$ $2.010185e-03$ $3.691257e+00$	$7.347257e-04$ $4.816046e-04$ $1.994804e-03$ $7.378840e+00$

$\mu = 0.01, p(\rho) = 100\rho$						
$\tau \setminus h$	0.005	0.0025	0.00125	0.000625	0.0003125	0.00015625
0.005	$0.000000e+00$ $-nan$ $-nan$ $1.678600e-02$	$0.000000e+00$ $-nan$ $-nan$ $1.472000e-02$	$0.000000e+00$ $-nan$ $-nan$ $3.843300e-02$	$0.000000e+00$ nan nan $5.802500e-02$	$0.000000e+00$ $-nan$ $-nan$ $1.250840e-01$	$0.000000e+00$ $-nan$ $-nan$ $2.317480e-01$
0.0025	$0.000000e+00$ nan nan $1.476500e-02$	$0.000000e+00$ nan nan $2.920600e-02$	$0.000000e+00$ nan nan $6.833100e-02$	$0.000000e+00$ $-nan$ $-nan$ $1.253970e-01$	$0.000000e+00$ $-nan$ $-nan$ $2.317490e-01$	$0.000000e+00$ $-nan$ $-nan$ $4.619390e-01$
0.00125	$0.000000e+00$ nan nan $2.938900e-02$	$0.000000e+00$ $-nan$ $-nan$ $5.825900e-02$	$0.000000e+00$ $-nan$ $-nan$ $1.160580e-01$	$0.000000e+00$ nan nan $2.312040e-01$	$0.000000e+00$ nan nan $4.625210e-01$	$0.000000e+00$ nan nan $9.251190e-01$
0.000625	$3.875203e-03$ $2.219355e-03$ $1.329300e-02$ $5.860400e-02$	$0.000000e+00$ $-nan$ $-nan$ $1.163060e-01$	$0.000000e+00$ nan nan $2.319200e-01$	$0.000000e+00$ nan nan $4.625050e-01$	$0.000000e+00$ $-nan$ $-nan$ $9.242360e-01$	$0.000000e+00$ $-nan$ $-nan$ $1.847788e+00$
0.0003125	$2.417445e-03$ $1.306728e-03$ $9.494630e-03$ $1.171230e-01$	$1.707263e-03$ $1.029704e-03$ $5.296081e-03$ $2.325260e-01$	$0.000000e+00$ nan nan $4.735570e-01$	$0.000000e+00$ $-nan$ $-nan$ $9.242640e-01$	$0.000000e+00$ nan nan $1.847724e+00$	$0.000000e+00$ nan nan $3.701977e+00$
0.00015625	$1.687110e-03$ $8.879987e-04$ $7.633719e-03$ $2.343890e-01$	$9.719095e-04$ $5.558151e-04$ $3.338353e-03$ $4.650250e-01$	$7.957610e-04$ $4.971985e-04$ $2.315496e-03$ $9.262090e-01$	$8.344639e+00$ $2.806930e+00$ $3.998717e+03$ $1.849222e+00$	$0.000000e+00$ nan nan $3.695493e+00$	$0.000000e+00$ nan nan $7.387029e+00$

$\mu = 0.001, p(\rho) = 100\rho$						
$\tau \setminus h$	0.005	0.0025	0.00125	0.000625	0.0003125	0.00015625
0.005	$0.000000e+00$ $-nan$ $-nan$ $7.449000e-03$	$0.000000e+00$ $-nan$ $-nan$ $1.469300e-02$	$0.000000e+00$ $-nan$ $-nan$ $2.923800e-02$	$0.000000e+00$ nan nan $5.807400e-02$	$0.000000e+00$ nan nan $1.162890e-01$	$0.000000e+00$ nan nan $2.408650e-01$
0.0025	$0.000000e+00$ nan nan $1.474600e-02$	$0.000000e+00$ nan nan $2.925700e-02$	$0.000000e+00$ $-nan$ $-nan$ $5.809300e-02$	$0.000000e+00$ nan nan $1.163280e-01$	$0.000000e+00$ nan nan $2.313050e-01$	$0.000000e+00$ $-nan$ $-nan$ $4.620320e-01$
0.00125	$0.000000e+00$ $-nan$ $-nan$ $2.939900e-02$	$0.000000e+00$ $-nan$ $-nan$ $5.829500e-02$	$0.000000e+00$ $-nan$ $-nan$ $1.160300e-01$	$0.000000e+00$ $-nan$ $-nan$ $2.312500e-01$	$0.000000e+00$ $-nan$ $-nan$ $4.622240e-01$	$0.000000e+00$ $-nan$ $-nan$ $9.230520e-01$
0.000625	$0.000000e+00$ nan nan $5.864900e-02$	$0.000000e+00$ nan nan $1.216810e-01$	$0.000000e+00$ $-nan$ $-nan$ $2.320680e-01$	$0.000000e+00$ nan nan $4.625580e-01$	$0.000000e+00$ $-nan$ $-nan$ $9.257180e-01$	$0.000000e+00$ nan nan $1.845128e+00$
0.0003125	$0.000000e+00$ $-nan$ $-nan$ $1.172640e-01$	$0.000000e+00$ $-nan$ $-nan$ $2.328580e-01$	$0.000000e+00$ nan nan $4.637990e-01$	$0.000000e+00$ nan nan $9.243740e-01$	$0.000000e+00$ nan nan $1.859363e+00$	$0.000000e+00$ $-nan$ $-nan$ $3.698847e+00$
0.00015625	$1.641701e-03$ $8.844172e-04$ $7.643047e-03$ $2.343140e-01$	$0.000000e+00$ nan nan $4.685050e-01$	$0.000000e+00$ nan nan $9.270240e-01$	$0.000000e+00$ nan nan $1.849776e+00$	$0.000000e+00$ $-nan$ $-nan$ $3.693884e+00$	$0.000000e+00$ nan nan $7.389611e+00$

$\mu = 0.1, p(\rho) = \rho^{1.4}$						
$\tau \setminus h$	0.005	0.0025	0.00125	0.000625	0.0003125	0.00015625
0.005	$1.706045e-01$	$1.695805e-01$	$1.693242e-01$	$1.692604e-01$	$1.692473e-01$	$1.692432e-01$
	$7.077821e-02$	$7.043296e-02$	$7.034590e-02$	$7.032429e-02$	$7.031900e-02$	$7.031769e-02$
	$1.296421e+00$	$1.287694e+00$	$1.285382e+00$	$1.284789e+00$	$1.284648e+00$	$1.284614e+00$
	$9.653000e-03$	$1.919000e-02$	$3.814700e-02$	$7.587800e-02$	$1.515670e-01$	$3.025240e-01$
0.0025	$8.457763e-02$	$8.351026e-02$	$8.324401e-02$	$8.317756e-02$	$8.316295e-02$	$8.315886e-02$
	$3.529897e-02$	$3.494365e-02$	$3.485697e-02$	$3.483581e-02$	$3.483063e-02$	$3.482933e-02$
	$6.388418e-01$	$6.297914e-01$	$6.275862e-01$	$6.270476e-01$	$6.269165e-01$	$6.268839e-01$
	$1.925800e-02$	$3.815900e-02$	$7.616900e-02$	$1.519610e-01$	$3.024310e-01$	$6.041500e-01$
0.00125	$4.257291e-02$	$4.144679e-02$	$4.119084e-02$	$4.112669e-02$	$4.111053e-02$	$4.110650e-02$
	$1.779484e-02$	$1.742509e-02$	$1.733935e-02$	$1.731859e-02$	$1.731348e-02$	$1.731220e-02$
	$3.217010e-01$	$3.121911e-01$	$3.100425e-01$	$3.095263e-01$	$3.093995e-01$	$3.093679e-01$
	$3.828100e-02$	$7.645000e-02$	$1.517220e-01$	$3.126680e-01$	$6.042710e-01$	$1.207063e+00$
0.000625	$2.210761e-02$	$2.077249e-02$	$2.050818e-02$	$2.044370e-02$	$2.042758e-02$	$2.042355e-02$
	$9.146072e-03$	$8.742080e-03$	$8.655232e-03$	$8.634570e-03$	$8.629485e-03$	$8.628218e-03$
	$1.671480e-01$	$1.564907e-01$	$1.543099e-01$	$1.538001e-01$	$1.536753e-01$	$1.536443e-01$
	$7.670700e-02$	$1.521230e-01$	$3.031910e-01$	$6.108930e-01$	$1.217862e+00$	$2.412986e+00$
0.0003125	$1.220562e-02$	$1.054251e-02$	$1.026370e-02$	$1.019846e-02$	$1.018244e-02$	$1.017842e-02$
	$4.896447e-03$	$4.425231e-03$	$4.334201e-03$	$4.313348e-03$	$4.308263e-03$	$4.307000e-03$
	$9.239549e-02$	$7.955691e-02$	$7.723327e-02$	$7.671819e-02$	$7.659387e-02$	$7.656305e-02$
	$1.527590e-01$	$3.038470e-01$	$6.063870e-01$	$1.218437e+00$	$2.428881e+00$	$4.825812e+00$
0.00015625	$7.265290e-03$	$5.511580e-03$	$5.167952e-03$	$5.101333e-03$	$5.085185e-03$	$5.081202e-03$
	$2.862024e-03$	$2.279748e-03$	$2.179642e-03$	$2.158221e-03$	$2.153107e-03$	$2.151843e-03$
	$5.766995e-02$	$4.154228e-02$	$3.891035e-02$	$3.837610e-02$	$3.825096e-02$	$3.822020e-02$
	$3.060650e-01$	$6.077000e-01$	$1.211955e+00$	$2.428425e+00$	$4.836315e+00$	$9.653870e+00$

$\mu = 0.01, p(\rho) = \rho^{1.4}$						
$\tau \setminus h$	0.005	0.0025	0.00125	0.000625	0.0003125	0.00015625
0.005	$2.044482e-01$	$0.000000e+00$	$0.000000e+00$	$0.000000e+00$	$0.000000e+00$	$0.000000e+00$
	$7.467224e-02$	nan	nan	nan	nan	nan
	$1.946596e+00$	nan	nan	nan	nan	nan
	$9.635000e-03$	$2.819300e-02$	$3.620100e-02$	$7.167000e-02$	$1.427330e-01$	$2.853330e-01$
0.0025	$7.794318e-02$	$7.704660e-02$	$0.000000e+00$	$0.000000e+00$	$0.000000e+00$	$0.000000e+00$
	$3.414842e-02$	$3.378200e-02$	$-nan$	nan	$-nan$	$-nan$
	$7.570298e-01$	$7.418792e-01$	$-nan$	nan	$-nan$	$-nan$
	$2.915900e-02$	$4.877900e-02$	$7.516800e-02$	$1.488110e-01$	$2.940430e-01$	$5.965210e-01$
0.00125	$3.626583e-02$	$3.592626e-02$	$3.606035e-02$	$3.609067e-02$	$3.609859e-02$	$3.610112e-02$
	$1.655812e-02$	$1.621748e-02$	$1.615747e-02$	$1.614402e-02$	$1.614076e-02$	$1.613995e-02$
	$3.570426e-01$	$3.450495e-01$	$3.431007e-01$	$3.426782e-01$	$3.425766e-01$	$3.429257e-01$
	$3.829500e-02$	$7.656800e-02$	$1.616030e-01$	$3.076930e-01$	$6.117060e-01$	$1.215711e+00$
0.000625	$1.820844e-02$	$1.734556e-02$	$1.744792e-02$	$1.748683e-02$	$1.749701e-02$	$1.749958e-02$
	$8.406248e-03$	$7.979580e-03$	$7.921240e-03$	$7.909751e-03$	$7.907073e-03$	$7.906415e-03$
	$1.821730e-01$	$1.675986e-01$	$1.658908e-01$	$1.655887e-01$	$1.655209e-01$	$1.655045e-01$
	$8.487800e-02$	$1.520680e-01$	$3.124030e-01$	$6.141140e-01$	$1.219736e+00$	$2.412807e+00$
0.0003125	$1.016166e-02$	$8.542526e-03$	$8.571057e-03$	$8.606491e-03$	$8.616719e-03$	$8.619327e-03$
	$4.629786e-03$	$3.998062e-03$	$3.928132e-03$	$3.916765e-03$	$3.914311e-03$	$3.913721e-03$
	$1.055329e-01$	$8.382995e-02$	$8.174155e-02$	$8.146274e-02$	$8.140845e-02$	$8.139584e-02$
	$1.620620e-01$	$3.139090e-01$	$6.063460e-01$	$1.209040e+00$	$2.415086e+00$	$4.823369e+00$
0.00015625	$6.932529e-03$	$4.341762e-03$	$4.237283e-03$	$4.264879e-03$	$4.274843e-03$	$4.277615e-03$
	$3.009020e-03$	$2.061902e-03$	$1.963085e-03$	$1.950225e-03$	$1.947780e-03$	$1.947217e-03$
	$7.542591e-02$	$4.393059e-02$	$4.076177e-02$	$4.043259e-02$	$4.038083e-02$	$4.036981e-02$
	$3.052210e-01$	$6.081100e-01$	$1.212473e+00$	$2.418077e+00$	$4.828728e+00$	$9.648475e+00$

$\mu = 0.001, p(\rho) = \rho^{1.4}$						
$\tau \setminus h$	0.005	0.0025	0.00125	0.000625	0.0003125	0.00015625
0.005	$0.000000e+00$ $-nan$ $-nan$ $1.967600e-02$	$0.000000e+00$ nan nan $1.807600e-02$	$0.000000e+00$ nan nan $3.566100e-02$	$0.000000e+00$ nan nan $7.094300e-02$	$0.000000e+00$ nan nan $1.413970e-01$	$0.000000e+00$ nan nan $2.818480e-01$
0.0025	$0.000000e+00$ nan nan $1.885800e-02$	$0.000000e+00$ nan nan $3.699900e-02$	$0.000000e+00$ nan nan $7.102900e-02$	$0.000000e+00$ nan nan $1.410750e-01$	$0.000000e+00$ nan nan $2.812710e-01$	$0.000000e+00$ nan nan $5.619000e-01$
0.00125	$7.983929e-02$ $2.342631e-02$ $5.068147e+00$ $4.740000e-02$	$0.000000e+00$ $-nan$ $-nan$ $7.542100e-02$	$0.000000e+00$ nan nan $1.500660e-01$	$0.000000e+00$ nan nan $2.820150e-01$	$0.000000e+00$ nan nan $5.613340e-01$	$0.000000e+00$ nan nan $1.121492e+00$
0.000625	$2.201153e-02$ $8.655093e-03$ $4.381088e-01$ $8.666200e-02$	$1.687576e-02$ $7.970136e-03$ $1.950966e-01$ $1.520430e-01$	$1.686784e-02$ $7.975823e-03$ $1.948290e-01$ $3.037280e-01$	$0.000000e+00$ nan nan $6.023120e-01$	$0.000000e+00$ nan nan $1.165194e+00$	$0.000000e+00$ nan nan $2.242980e+00$
0.0003125	$1.251618e-02$ $5.092691e-03$ $1.776548e-01$ $1.527140e-01$	$8.661415e-03$ $3.943722e-03$ $9.670960e-02$ $3.038850e-01$	$8.202282e-03$ $3.906231e-03$ $9.440672e-02$ $6.059600e-01$	$8.341972e-03$ $3.914970e-03$ $9.458416e-02$ $1.210741e+00$	$1.700649e+00$ $3.232768e-01$ $3.165305e+02$ $2.415941e+00$	$5.168797e+00$ $1.394496e+00$ $4.645061e+03$ $4.826810e+00$
0.00015625	$1.066272e-02$ $3.871962e-03$ $1.270728e-01$ $3.054590e-01$	$4.914564e-03$ $2.056291e-03$ $5.176541e-02$ $6.078590e-01$	$4.004981e-03$ $1.933495e-03$ $4.664213e-02$ $1.211678e+00$	$4.111847e-03$ $1.937061e-03$ $4.659634e-02$ $2.419923e+00$	$4.150815e-03$ $1.940142e-03$ $4.666816e-02$ $4.831023e+00$	$4.161059e-03$ $1.941048e-03$ $4.669131e-02$ $9.660136e+00$

Вложенная сетка, плотность

$\mu = 0.1, p(\rho) = 1\rho$		
	tau=h=0.01	tau=h=0.001
$h - h^1$	$5.223002e-01$ $1.350436e-01$ $5.334825e+00$	$3.166982e-02$ $8.600421e-03$ $2.949122e-01$
$h - h^2$	$6.128827e-01$ $1.743737e-01$ $6.692537e+00$	$4.780349e-02$ $1.294066e-02$ $4.414830e-01$
$h - h^3$	$6.404276e-01$ $1.893355e-01$ $7.216256e+00$	$5.594455e-02$ $1.512291e-02$ $5.146063e-01$
$h - \rho$	$6.525722e-01$ $2.022396e-01$ $7.680877e+00$	$6.413494e-02$ $1.731402e-02$ $5.876434e-01$

$\mu = 0.01, p(\rho) = 1\rho$		
	tau=h=0.01	tau=h=0.001
$h - h^1$	$6.002904e+00$ $1.303480e+00$ $1.736705e+02$	$3.913667e-01$ $7.384558e-02$ $4.606453e+00$
$h - h^2$	$5.342923e+00$ $1.448873e+00$ $1.683045e+02$	$5.661443e-01$ $1.092706e-01$ $6.571359e+00$
$h - h^3$	$5.475949e+00$ $1.494066e+00$ $1.646203e+02$	$6.485901e-01$ $1.266163e-01$ $7.480678e+00$
$h - \rho$	$5.780942e+00$ $1.548715e+00$ $1.641333e+02$	$7.270385e-01$ $1.437217e-01$ $8.345515e+00$

$\mu = 0.1, p(\rho) = 10\rho$		
	tau=h=0.01	tau=h=0.001
$h - h^1$	$0.000000e+00$ $-nan$ $-nan$	$3.417283e-03$ $1.700900e-03$ $9.083366e-03$
$h - h^2$	$0.000000e+00$ $-nan$ $-nan$	$5.120371e-03$ $2.550624e-03$ $1.359994e-02$
$h - h^3$	$0.000000e+00$ $-nan$ $-nan$	$5.970523e-03$ $2.975303e-03$ $1.585202e-02$
$h - \rho$	$0.000000e+00$ $-nan$ $-nan$	$6.819746e-03$ $3.399861e-03$ $1.810001e-02$

$\mu = 0.1, p(\rho) = \rho^{1,4}$		
	tau=h=0.01	tau=h=0.001
$h - h^1$	$1.810754e-01$	$1.653108e-02$
	$7.431081e-02$	$6.948234e-03$
	$1.464890e+00$	$1.244371e-01$
$h - h^2$	$2.661235e-01$	$2.472064e-02$
	$1.096692e-01$	$1.040477e-02$
	$2.116489e+00$	$1.860476e-01$
$h - h^3$	$3.056367e-01$	$2.879527e-02$
	$1.268425e-01$	$1.212853e-02$
	$2.423717e+00$	$2.167010e-01$
$h - \rho$	$3.458994e-01$	$3.285604e-02$
	$1.436457e-01$	$1.384925e-02$
	$2.718655e+00$	$2.472530e-01$

$\mu = 0.01, p(\rho) = \rho^{1,4}$		
	tau=h=0.01	tau=h=0.001
$h - h^1$	$0.000000e+00$	$1.460322e-02$
	nan	$6.516847e-03$
	nan	$1.391208e-01$
$h - h^2$	$0.000000e+00$	$2.162859e-02$
	nan	$9.692793e-03$
	nan	$2.057426e-01$
$h - h^3$	$0.000000e+00$	$2.507996e-02$
	nan	$1.126091e-02$
	nan	$2.383676e-01$
$h - \rho$	$0.000000e+00$	$2.849158e-02$
	nan	$1.281607e-02$
	nan	$2.705524e-01$