

1 Постановка задачи

Решается система дифференциальных уравнений

$$\frac{\partial \rho}{\partial t} + \frac{\partial \rho u}{\partial x} = 0 \quad (1)$$

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

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

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

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

С граничными условиями:

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

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

Расписанная схема имеет вид:

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

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

2 Задание 1

Зададим функции давления и скорости:

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

$$u(t, x) = \cos(2\pi t)\sin(4\pi x) \quad (10)$$

И вычислим правые части f_0 и f исходных уравнений:

```
1 inline double f_0(double t, double x)
2 {
3     double dro_dt = std::exp(t) * (std::cos(3 * M_PI * x) + 1.5);
4     double drou_dx = std::exp(t) * std::cos(2 * M_PI * t) *
5     (4 * M_PI * std::cos(3 * M_PI * x) * std::cos(4 * M_PI * x) -
6     3 * M_PI * std::sin(3 * M_PI * x) * std::sin(4 * M_PI * x)) +
7     6 * M_PI * std::exp(t) * std::cos(2 * M_PI * t) * std::cos(4 * M_PI * x);
8     return dro_dt + drou_dx;
9 }
```

В случае линейной зависимости давления от плотности:

```
1 inline double f_lin(double t, double x, double C, double mu)
2 {
3     double ro = std::exp(t) * (std::cos(3 * M_PI * x) + 1.5);
4
5     double drou_dt = (std::cos(3 * M_PI * x) * std::sin(4 * M_PI * x) +
6     1.5 * std::sin(4 * M_PI * x)) *
7     std::exp(t) * (std::cos(2 * M_PI * t) -
8     2 * M_PI * std::sin(2 * M_PI * t));
9
10    double drou2_dx = std::exp(t) * std::cos(2 * M_PI * t) *
11    std::cos(2 * M_PI * t) *
12    (-3 * M_PI * std::sin(3 * M_PI * x) *
13    std::sin(4 * M_PI * x) * std::sin(4 * M_PI * x) +
14    8 * M_PI * std::sin(4 * M_PI * x) *
15    std::cos(4 * M_PI * x) * std::cos(3 * M_PI * x)) +
16    12 * M_PI * std::exp(t) * std::cos(2 * M_PI * t) *
17    std::cos(2 * M_PI * t) * std::sin(4 * M_PI * x) *
18    std::cos(4 * M_PI * x);
19
20    double d2u_dx2 = -1 * mu * 16 * M_PI * M_PI *
21    std::cos(2 * M_PI * t) * std::sin(4 * M_PI * x);
22
23    double dp_dx = C * std::exp(t) * (-3 * M_PI) * std::sin(3 * M_PI * x);
24
25    return (drou_dt + drou2_dx + dp_dx - d2u_dx2) / ro;
26 }
```

В случай степенно зависимости давления от плотности

```

1 inline double f_pow(double t, double x, double gamma, double mu)
2 {
3     double ro = std::exp(t) * (std::cos(3 * M_PI * x) + 1.5);
4
5     double drou_dt = (std::cos(3 * M_PI * x) * std::sin(4 * M_PI * x) +
6     1.5 * std::sin(4 * M_PI * x)) *
7     std::exp(t) * (std::cos(2 * M_PI * t) -
8     2 * M_PI * std::sin(2 * M_PI * t));
9
10    double drou2_dx = std::exp(t) * std::cos(2 * M_PI * t) *
11    std::cos(2 * M_PI * t) *
12    (-3 * M_PI * std::sin(3 * M_PI * x) *
13    std::sin(4 * M_PI * x) * std::sin(4 * M_PI * x) +
14    8 * M_PI * std::sin(4 * M_PI * x) *
15    std::cos(4 * M_PI * x) * std::cos(3 * M_PI * x)) +
16    12 * M_PI * std::exp(t) * std::cos(2 * M_PI * t) *
17    std::cos(2 * M_PI * t) * std::sin(4 * M_PI * x) *
18    std::cos(4 * M_PI * x);
19
20    double d2u_dx2 = -1 * mu * 16 * M_PI * M_PI *
21    std::cos(2 * M_PI * t) * std::sin(4 * M_PI * x);
22
23    double dp_dx = gamma * std::pow(std::exp(t) *
24    (std::cos(3 * M_PI * x) + 1.5), gamma - 1) *
25    std::exp(t) * (-3 * M_PI) * std::sin(3 * M_PI * x);
26
27    return (drou_dt + drou2_dx + dp_dx - d2u_dx2) / ro;
28 }

```

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 3.395492e + 01 4.570024e + 02 2.400000e - 05	3.545344e + 02 1.050477e + 02 5.326644e + 03 2.120000e - 04	6.742111e + 02 5.715137e + 01 9.345787e + 04 1.962000e - 03	2.835957e + 03 2.593582e + 02 2.439587e + 06 1.946400e - 02
0.01	0.000000e + 00 -nan -nan 1.810000e - 04	6.525722e - 01 2.022396e - 01 7.680877e + 00 1.877000e - 03	6.143926e - 01 1.958126e - 01 7.438442e + 00 1.812000e - 02	6.139451e - 01 1.957057e - 01 7.433561e + 00 1.796290e - 01
0.001	0.000000e + 00 -nan -nan 1.779000e - 03	5.108329e - 02 1.630812e - 02 5.832398e - 01 1.825500e - 02	6.413494e - 02 1.731402e - 02 5.876434e - 01 1.788490e - 01	6.427001e - 02 1.736038e - 02 5.884120e - 01 1.790802e + 00
0.0001	0.000000e + 00 -nan -nan 1.773900e - 02	2.419057e - 02 1.029436e - 02 2.738106e - 01 1.814030e - 01	6.425888e - 03 1.709786e - 03 5.768847e - 02 1.785686e + 00	6.563319e - 03 1.759136e - 03 5.855014e - 02 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 1.194566e + 75 1.693590e + 76 6.600000e - 05	1.294183e + 05 2.249596e + 04 3.184192e + 06 2.080000e - 04	1.452502e + 29 1.027074e + 29 1.452503e + 32 1.960000e - 03	1.230401e + 23 8.502810e + 22 1.202479e + 27 1.938900e - 02
0.01	0.000000e + 00 -nan -nan 5.240000e - 04	5.780942e + 00 1.548715e + 00 1.641333e + 02 2.283000e - 03	0.000000e + 00 -nan -nan 1.904400e - 02	0.000000e + 00 -nan -nan 1.795770e - 01
0.001	0.000000e + 00 -nan -nan 5.625000e - 03	4.655542e - 01 9.942960e - 02 6.712588e + 00 1.949600e - 02	7.270385e - 01 1.437217e - 01 8.345515e + 00 1.808870e - 01	7.306682e - 01 1.442355e - 01 8.368183e + 00 1.794873e + 00
0.0001	0.000000e + 00 -nan -nan 2.852800e - 02	2.206853e - 01 5.282039e - 02 3.026331e + 00 1.853180e - 01	6.536694e - 02 1.351189e - 02 7.341024e - 01 1.790224e + 00	6.837935e - 02 1.401443e - 02 7.524592e - 01 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 1.444989e + 42 2.048625e + 43 6.900000e - 05	0.000000e + 00 -nan -nan 3.460000e - 04	0.000000e + 00 -nan -nan 3.241000e - 03	0.000000e + 00 -nan -nan 3.703100e - 02
0.01	0.000000e + 00 -nan -nan 5.410000e - 04	0.000000e + 00 -nan -nan 3.101000e - 03	0.000000e + 00 -nan -nan 2.985600e - 02	0.000000e + 00 -nan -nan 3.068310e - 01
0.001	0.000000e + 00 -nan -nan 5.082000e - 03	1.358740e + 00 2.103964e - 01 2.806105e + 01 3.006800e - 02	2.943780e + 00 3.784003e - 01 1.209677e + 02 2.949820e - 01	0.000000e + 00 -nan -nan 2.944399e + 00
0.0001	0.000000e + 00 -nan -nan 3.562600e - 02	1.066400e + 00 2.075186e - 01 2.151732e + 01 2.986890e - 01	2.712902e - 01 2.801289e - 02 5.493726e + 00 2.952293e + 00	2.685096e - 01 2.936044e - 02 5.659019e + 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 1.804011e + 09 3.268447e + 09 2.500000e - 05	inf -nan -nan 2.090000e - 04	7.392997e + 51 5.227638e + 51 7.392999e + 54 1.961000e - 03	3.038886e + 107 2.147232e + 107 3.036645e + 111 1.940500e - 02
0.01	2.241266e + 00 1.067949e + 00 1.713333e + 01 1.830000e - 04	0.000000e + 00 -nan -nan 1.879000e - 03	0.000000e + 00 -nan -nan 1.814500e - 02	0.000000e + 00 -nan -nan 1.839330e - 01
0.001	2.505101e + 00 1.196460e + 00 1.790488e + 01 1.762000e - 03	1.052819e - 02 4.519415e - 03 3.560847e - 02 1.838600e - 02	6.819746e - 03 3.399861e - 03 1.810001e - 02 1.789160e - 01	6.789148e - 03 3.391741e - 03 1.798926e - 02 1.832159e + 00
0.0001	2.506552e + 00 1.234506e + 00 1.814316e + 01 1.768100e - 02	4.772559e - 03 2.015167e - 03 2.430710e - 02 1.814730e - 01	7.110225e - 04 3.481438e - 04 1.917962e - 03 1.786451e + 00	6.793548e - 04 3.396421e - 04 1.798243e - 03 1.815251e + 01
$\mu = 0.01, p(\rho) = 10\rho$				
$\tau \setminus h$	0.1	0.01	0.001	0.0001
0.1	inf -nan -nan 2.400000e - 05	0.000000e + 00 -nan -nan 5.930000e - 04	0.000000e + 00 -nan -nan 5.910000e - 03	0.000000e + 00 -nan -nan 1.942300e - 02
0.01	0.000000e + 00 -nan -nan 2.010000e - 04	0.000000e + 00 -nan -nan 1.866000e - 03	0.000000e + 00 -nan -nan 1.809800e - 02	0.000000e + 00 -nan -nan 1.913770e - 01
0.001	0.000000e + 00 -nan -nan 1.800000e - 03	8.905592e - 03 4.299584e - 03 3.793391e - 02 1.825100e - 02	0.000000e + 00 -nan -nan 1.870870e - 01	0.000000e + 00 -nan -nan 1.819435e + 00
0.0001	0.000000e + 00 -nan -nan 1.769200e - 02	4.151117e - 03 2.278634e - 03 2.907894e - 02 1.812890e - 01	5.750068e - 04 3.240186e - 04 1.677597e - 03 1.789208e + 00	5.462061e - 04 3.175811e - 04 1.541143e - 03 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 1.987128e + 112 2.817241e + 113 2.400000e - 05	0.000000e + 00 -nan -nan 2.070000e - 04	0.000000e + 00 -nan -nan 1.947000e - 03	0.000000e + 00 -nan -nan 1.939500e - 02
0.01	0.000000e + 00 -nan -nan 1.810000e - 04	0.000000e + 00 -nan -nan 1.883000e - 03	0.000000e + 00 -nan -nan 1.812500e - 02	0.000000e + 00 -nan -nan 1.802160e - 01
0.001	0.000000e + 00 -nan -nan 1.800000e - 03	1.209360e - 02 4.680033e - 03 1.431018e - 01 1.823600e - 02	0.000000e + 00 -nan -nan 1.788120e - 01	0.000000e + 00 -nan -nan 1.788167e + 00
0.0001	0.000000e + 00 -nan -nan 2.749300e - 02	5.670305e - 03 2.674859e - 03 3.978128e - 02 1.813940e - 01	6.267854e - 04 3.293832e - 04 1.739247e - 03 1.796037e + 00	0.000000e + 00 -nan -nan 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 2.800564e + 103 3.970485e + 104 2.400000e - 05	0.000000e + 00 -nan -nan 2.240000e - 04	0.000000e + 00 -nan -nan 1.964000e - 03	0.000000e + 00 -nan -nan 1.944900e - 02
0.01	0.000000e + 00 -nan -nan 1.840000e - 04	0.000000e + 00 -nan -nan 1.882000e - 03	0.000000e + 00 -nan -nan 1.811400e - 02	0.000000e + 00 -nan -nan 1.796000e - 01
0.001	0.000000e + 00 -nan -nan 1.781000e - 03	8.674660e - 03 4.574784e - 03 3.558935e - 02 1.842400e - 02	0.000000e + 00 -nan -nan 1.789140e - 01	0.000000e + 00 -nan -nan 1.783111e + 00
0.0001	0.000000e + 00 -nan -nan 1.772600e - 02	4.459118e - 03 2.482966e - 03 2.497492e - 02 1.816870e - 01	5.090780e - 04 3.184410e - 04 1.487139e - 03 1.790525e + 00	4.700053e - 04 3.081752e - 04 1.275499e - 03 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 -nan -nan 2.700000e - 05	0.000000e + 00 -nan -nan 4.780000e - 04	0.000000e + 00 -nan -nan 1.947000e - 03	0.000000e + 00 -nan -nan 1.943000e - 02
0.01	0.000000e + 00 -nan -nan 1.810000e - 04	0.000000e + 00 -nan -nan 5.368000e - 03	0.000000e + 00 -nan -nan 1.815400e - 02	0.000000e + 00 -nan -nan 1.795170e - 01
0.001	0.000000e + 00 -nan -nan 1.765000e - 03	8.503219e - 03 4.514944e - 03 3.476676e - 02 2.799300e - 02	0.000000e + 00 -nan -nan 1.789590e - 01	0.000000e + 00 -nan -nan 1.786499e + 00
0.0001	0.000000e + 00 -nan -nan 1.766300e - 02	4.443286e - 03 2.486366e - 03 2.497838e - 02 1.815600e - 01	5.093738e - 04 3.182235e - 04 1.482229e - 03 1.786541e + 00	0.000000e + 00 -nan -nan 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 -nan -nan 2.500000e - 05	0.000000e + 00 -nan -nan 2.200000e - 04	0.000000e + 00 -nan -nan 1.962000e - 03	0.000000e + 00 -nan -nan 1.939600e - 02
0.01	0.000000e + 00 -nan -nan 1.810000e - 04	0.000000e + 00 -nan -nan 1.872000e - 03	0.000000e + 00 -nan -nan 1.851600e - 02	0.000000e + 00 -nan -nan 1.795050e - 01
0.001	0.000000e + 00 -nan -nan 1.780000e - 03	0.000000e + 00 -nan -nan 1.823100e - 02	0.000000e + 00 -nan -nan 1.816770e - 01	0.000000e + 00 -nan -nan 1.792104e + 00
0.0001	0.000000e + 00 -nan -nan 1.772700e - 02	4.453419e - 03 2.482664e - 03 2.799643e - 02 1.823180e - 01	0.000000e + 00 -nan -nan 1.820247e + 00	0.000000e + 00 -nan -nan 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 -nan -nan 3.100000e - 05	0.000000e + 00 -nan -nan 2.560000e - 04	0.000000e + 00 -nan -nan 2.450000e - 03	0.000000e + 00 -nan -nan 2.423200e - 02
0.01	0.000000e + 00 -nan -nan 2.250000e - 04	3.458994e - 01 1.436457e - 01 2.718655e + 00 2.431000e - 03	3.419444e - 01 1.419179e - 01 2.676938e + 00 2.374800e - 02	3.419118e - 01 1.419033e - 01 2.676276e + 00 2.356480e - 01
0.001	0.000000e + 00 -nan -nan 2.177000e - 03	4.136405e - 02 1.638657e - 02 3.162398e - 01 2.375200e - 02	3.285604e - 02 1.384925e - 02 2.472530e - 01 2.348980e - 01	3.280274e - 02 1.383192e - 02 2.468246e - 01 2.339907e + 00
0.0001	0.000000e + 00 -nan -nan 2.191700e - 02	1.440330e - 02 5.907827e - 03 1.422563e - 01 2.363970e - 01	3.305485e - 03 1.394517e - 03 2.488637e - 02 2.347709e + 00	3.249649e - 03 1.376649e - 03 2.444323e - 02 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 -nan -nan 3.400000e - 05	0.000000e + 00 -nan -nan 2.550000e - 04	0.000000e + 00 -nan -nan 2.410000e - 03	0.000000e + 00 -nan -nan 2.400900e - 02
0.01	0.000000e + 00 -nan -nan 2.280000e - 04	0.000000e + 00 -nan -nan 2.410000e - 03	0.000000e + 00 -nan -nan 2.236200e - 02	0.000000e + 00 -nan -nan 2.207160e - 01
0.001	0.000000e + 00 -nan -nan 2.189000e - 03	3.763576e - 02 1.648619e - 02 4.067476e - 01 2.372200e - 02	2.849158e - 02 1.281607e - 02 2.705524e - 01 2.347160e - 01	2.852086e - 02 1.280572e - 02 2.702514e - 01 2.339734e + 00
0.0001	0.000000e + 00 -nan -nan 2.179600e - 02	2.171814e - 02 8.993833e - 03 2.635254e - 01 2.362690e - 01	2.704533e - 03 1.253981e - 03 2.600322e - 02 2.346283e + 00	2.730692e - 03 1.243950e - 03 2.576084e - 02 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 -nan -nan 3.500000e - 05	0.000000e + 00 -nan -nan 2.580000e - 04	0.000000e + 00 -nan -nan 2.419000e - 03	0.000000e + 00 -nan -nan 2.397400e - 02
0.01	0.000000e + 00 -nan -nan 2.220000e - 04	0.000000e + 00 -nan -nan 2.348000e - 03	0.000000e + 00 -nan -nan 2.236400e - 02	0.000000e + 00 -nan -nan 2.240680e - 01
0.001	0.000000e + 00 -nan -nan 2.169000e - 03	7.939126e - 02 2.877219e - 02 3.627594e + 00 2.380000e - 02	0.000000e + 00 -nan -nan 2.327400e - 01	0.000000e + 00 -nan -nan 2.176548e + 00
0.0001	0.000000e + 00 -nan -nan 2.174300e - 02	5.098108e - 02 1.766025e - 02 1.683553e + 00 2.364780e - 01	2.548109e - 03 1.233000e - 03 2.969702e - 02 2.352005e + 00	2.656378e - 03 1.238167e - 03 2.974066e - 02 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 8.611497e - 02 3.137688e + 00 7.407000e - 03	2.915237e - 01 8.622999e - 02 3.131871e + 00 1.487000e - 02	2.913509e - 01 8.623645e - 02 3.129518e + 00 2.914100e - 02	2.913015e - 01 8.623747e - 02 3.128874e + 00 5.815800e - 02	2.913385e - 01 8.623915e - 02 3.128766e + 00 1.157880e - 01	2.913374e - 01 8.623975e - 02 3.128744e + 00 2.318680e - 01
0.0025	1.524219e - 01 4.202855e - 02 1.483760e + 00 1.476000e - 02	1.543208e - 01 4.260850e - 02 1.490807e + 00 2.921000e - 02	1.547432e - 01 4.275977e - 02 1.492612e + 00 5.818000e - 02	1.549055e - 01 4.279980e - 02 1.493119e + 00 1.157410e - 01	1.549308e - 01 4.281009e - 02 1.493253e + 00 2.311380e - 01	1.549417e - 01 4.281264e - 02 1.493286e + 00 4.626090e - 01
0.00125	7.691631e - 02 2.066607e - 02 7.220191e - 01 2.937800e - 02	7.913400e - 02 2.136305e - 02 7.325832e - 01 5.823900e - 02	7.966958e - 02 2.156384e - 02 7.357691e - 01 1.160410e - 01	7.980628e - 02 2.161647e - 02 7.366206e - 01 2.312140e - 01	7.984871e - 02 2.162970e - 02 7.368342e - 01 4.619780e - 01	7.985736e - 02 2.163300e - 02 7.368874e - 01 9.264950e - 01
0.000625	3.733308e - 02 9.988930e - 03 3.524930e - 01 5.863100e - 02	3.972090e - 02 1.061650e - 02 3.620059e - 01 1.163470e - 01	4.030919e - 02 1.083062e - 02 3.655893e - 01 2.317190e - 01	4.047760e - 02 1.088772e - 02 3.665641e - 01 4.624440e - 01	4.051570e - 02 1.090215e - 02 3.668107e - 01 9.230660e - 01	4.052520e - 02 1.090576e - 02 3.668725e - 01 1.846046e + 00
0.0003125	1.710448e - 02 4.860735e - 03 1.745043e - 01 1.171520e - 01	1.957835e - 02 5.194855e - 03 1.783389e - 01 2.324070e - 01	2.019278e - 02 5.401525e - 03 1.817985e - 01 4.710840e - 01	2.036015e - 02 5.459803e - 03 1.828096e - 01 9.240540e - 01	2.039974e - 02 5.474727e - 03 1.830702e - 01 1.852106e + 00	2.041011e - 02 5.478480e - 03 1.831359e - 01 3.692200e + 00
0.00015625	7.498453e - 03 2.823541e - 03 9.624038e - 02 2.341350e - 01	9.400183e - 03 2.494873e - 03 8.738025e - 02 4.651290e - 01	1.002532e - 02 2.669442e - 03 9.017108e - 02 9.357880e - 01	1.018984e - 02 2.726722e - 03 9.116381e - 02 1.846729e + 00	1.023049e - 02 2.741789e - 03 9.142896e - 02 3.734593e + 00	1.024057e - 02 2.745601e - 03 9.149631e - 02 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
$h - h^1$	1.458556e+00 4.420391e-01 1.268218e+01	1.047292e-01 3.737400e-02 1.035091e+00
$h - h^2$	6.253093e-01 1.791197e-01 6.891357e+00	5.344589e-02 1.418466e-02 4.968531e-01
$h - h^3$	6.802813e-01 2.065677e-01 7.712694e+00	5.920112e-02 1.672760e-02 5.668192e-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
$h - h^1$	7.976668e+00 2.359019e+00 1.723727e+02	9.803323e-01 2.569977e-01 1.534579e+01
$h - h^2$	7.884015e+00 1.681770e+00 1.753748e+02	6.843656e-01 1.436689e-01 1.000622e+01
$h - h^3$	5.598744e+00 1.506066e+00 1.626796e+02	7.000511e-01 1.367019e-01 7.740007e+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	1.507683e-02 4.411773e-03 8.573842e-02
$h - h^2$	0.000000e+00 -nan -nan	4.579081e-03 2.230182e-03 1.510687e-02
$h - h^3$	0.000000e+00 -nan -nan	5.694977e-03 2.731342e-03 1.524293e-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
$h - h^1$	3.315384e - 01 1.092135e - 01 2.537446e + 00	3.036827e - 02 1.025781e - 02 2.195616e - 01
$h - h^2$	2.924325e - 01 1.156558e - 01 2.207466e + 00	2.718940e - 02 1.135252e - 02 2.034640e - 01
$h - h^3$	3.196804e - 01 1.313291e - 01 2.537395e + 00	2.998066e - 02 1.245186e - 02 2.262433e - 01
$h - \rho$	3.458994e - 01 1.436457e - 01 2.718655e + 00	3.285604e - 02 1.384925e - 02 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 nan nan	1.866962e - 01 5.263695e - 02 1.942968e + 00
$h - h^2$	0.000000e + 00 nan nan	5.072173e - 02 2.208020e - 02 5.054689e - 01
$h - h^3$	0.000000e + 00 nan nan	1.717184e - 02 6.812702e - 03 1.679319e - 01
$h - \rho$	0.000000e + 00 nan nan	2.849158e - 02 1.281607e - 02 2.705524e - 01