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**Example 5**

In this example, we explore the progression of density across the annulus. In our numerical test, we take the initial data . The computational domain is . The mesh size and time step are set as and1/16, respectively. We take



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**Result**

1. **Free energy**

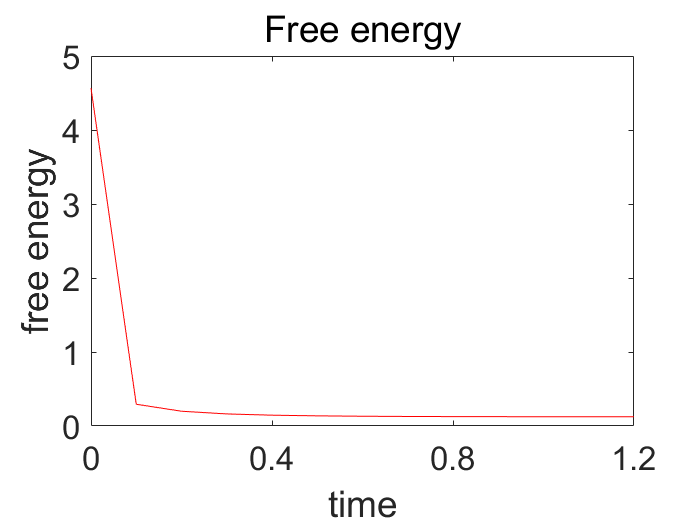


Figure 1 Mesh size(1/16), time step(tau=1/20000)

1. **The total mass**

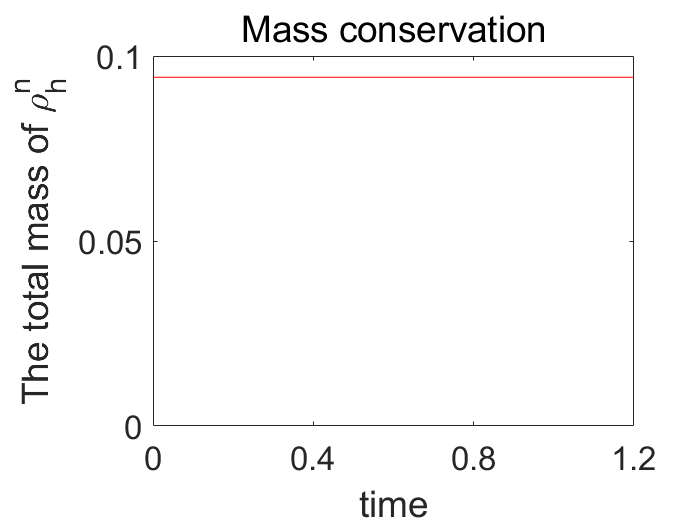
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Figure 2 Mesh size(1/16), time step(tau=1/20000)

1. **Numerical result**

|  |  |  |
| --- | --- | --- |
| rho_h_fill3_0  Figure 3 t = 0 | rho_h_fill3_4  Figure 4 t = 0.4 | rho_h_fill3_8  Figure 5 t =0.8 |
| rho_h_fill3_10  Figure 6 t = 1.0 | rho_h_fill3_11  Figure 7 t = 1.1 | rho_h_fill3_12  Figure 8 t = 1.2 |