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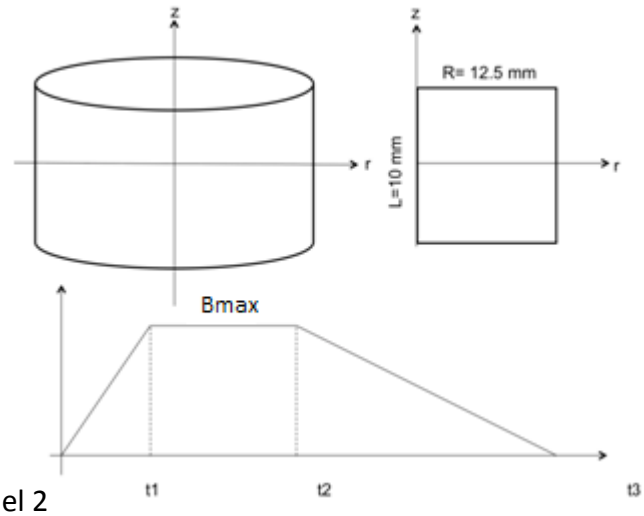
Benchmark test



Model parameters:

- Bulk radius = 12.5 mm
- Bulk height = 10 mm
- Critical current density J_c = $3\times10^8 A/m^2$
- t1 = 5 s
- t2 = 10 s
- t3 = 15 s
- B_{max} = 1 T in model 1 and B_{max} = 10 T in model 2
- Btrap is measured at 2 mm above the surface

Computer specifications:

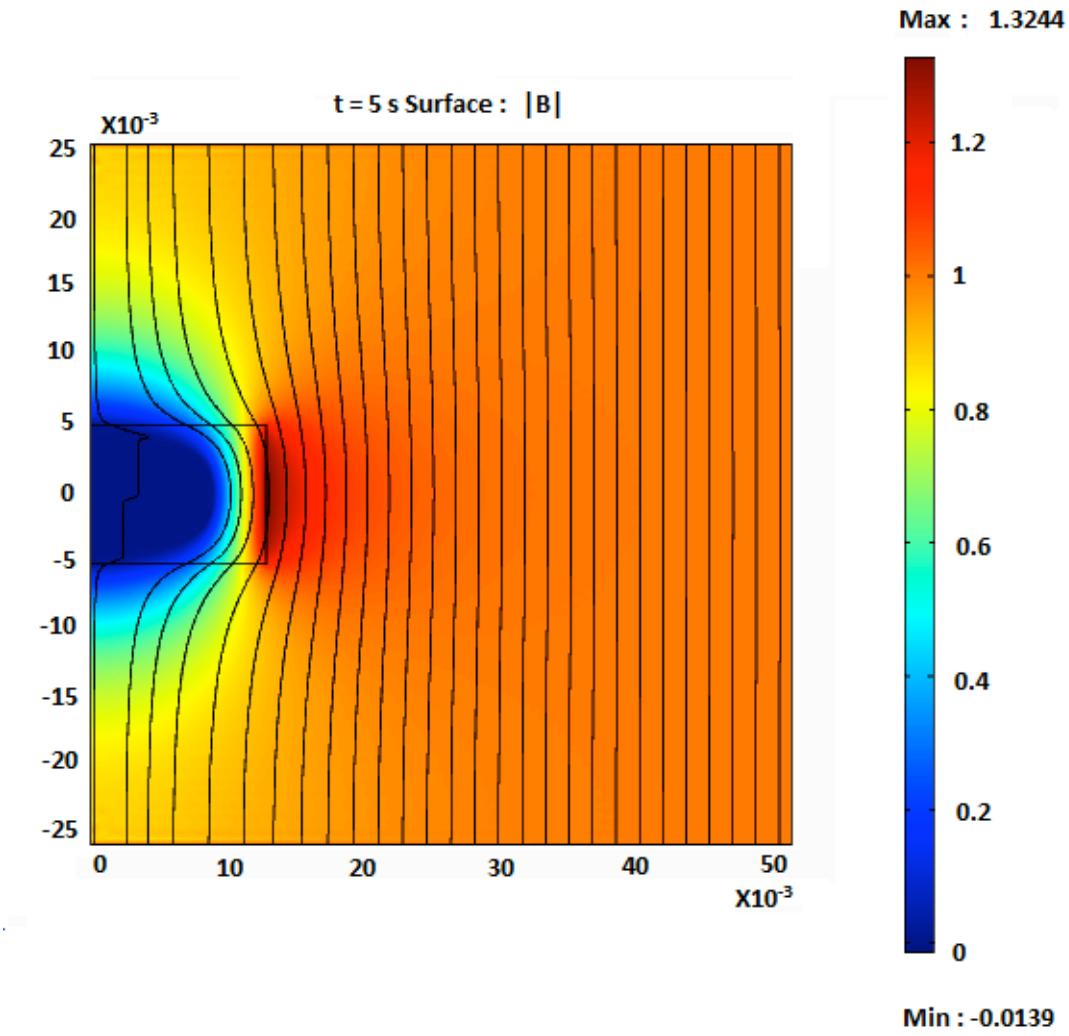
- Intel Core i7 CPU @ 2.67 GHz, 6 GB RAM, Windows 7 Professional operating system
- Cores used as per Comsol's default settings
- Comsol Multiphysics v3.5a, Direct (UMFPACK) solver, Time-stepping automatic (BDF)
- Relative tolerance = 1e-5, absolute tolerance = 1e-7

Results:

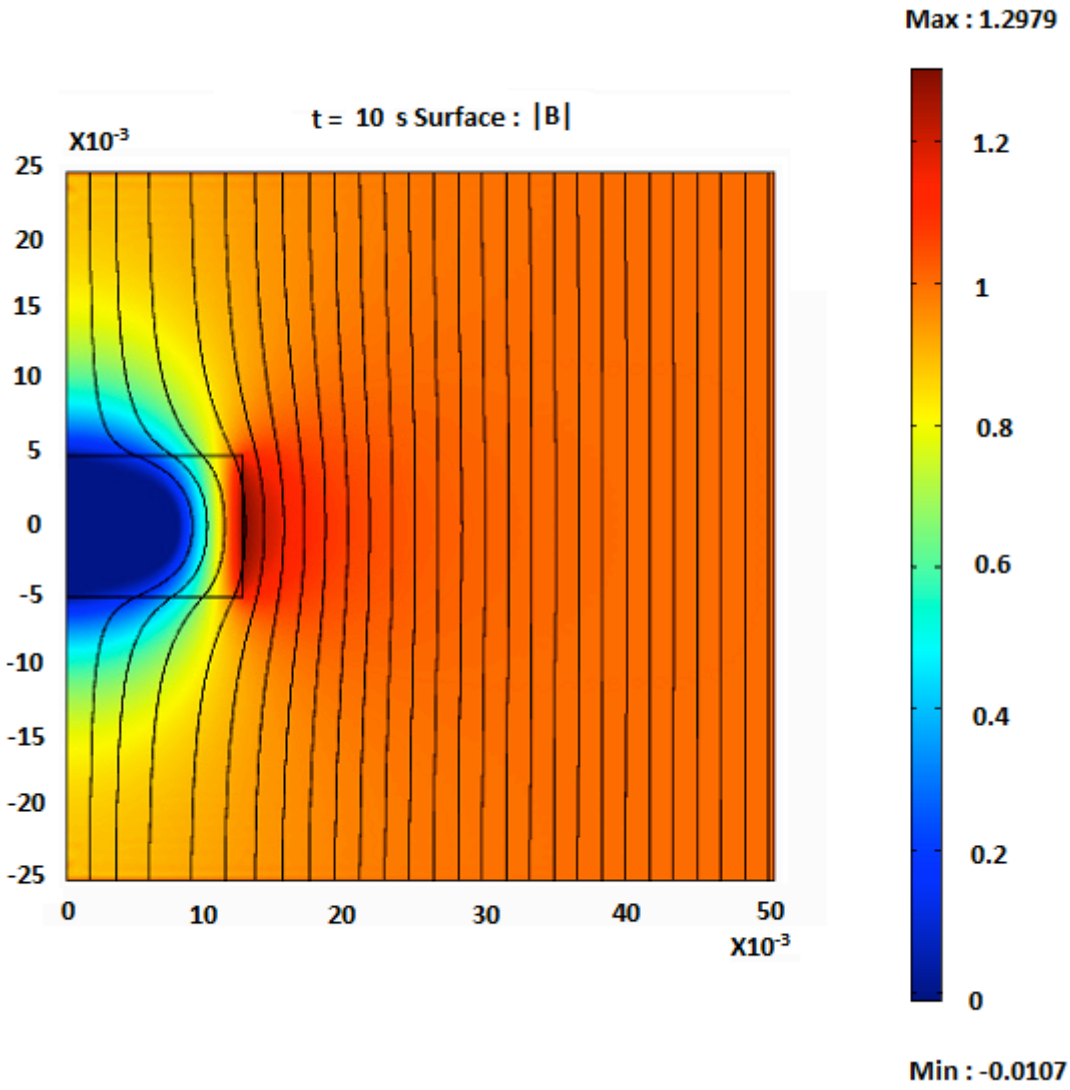
- A mapped mesh (40 across, 20 down) is used for the bulk and a free triangular mesh for the air sub-domain
- Total number of mesh elements = 8110
- Total DoFs = 36074

1 Magnetisation of bulk (with Bmax = 1 T)

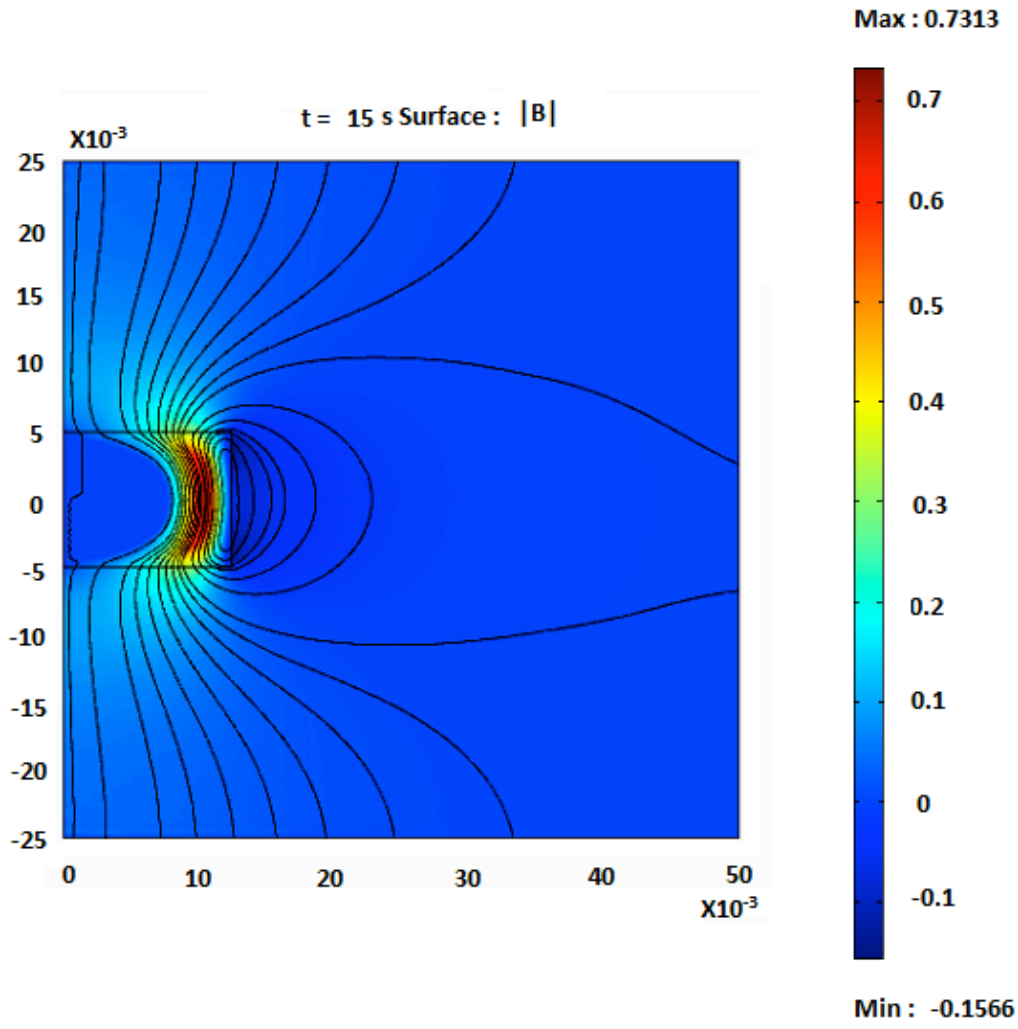
1.1 Magnetisation at t = t1



1.2 Magnetisation at t = t2

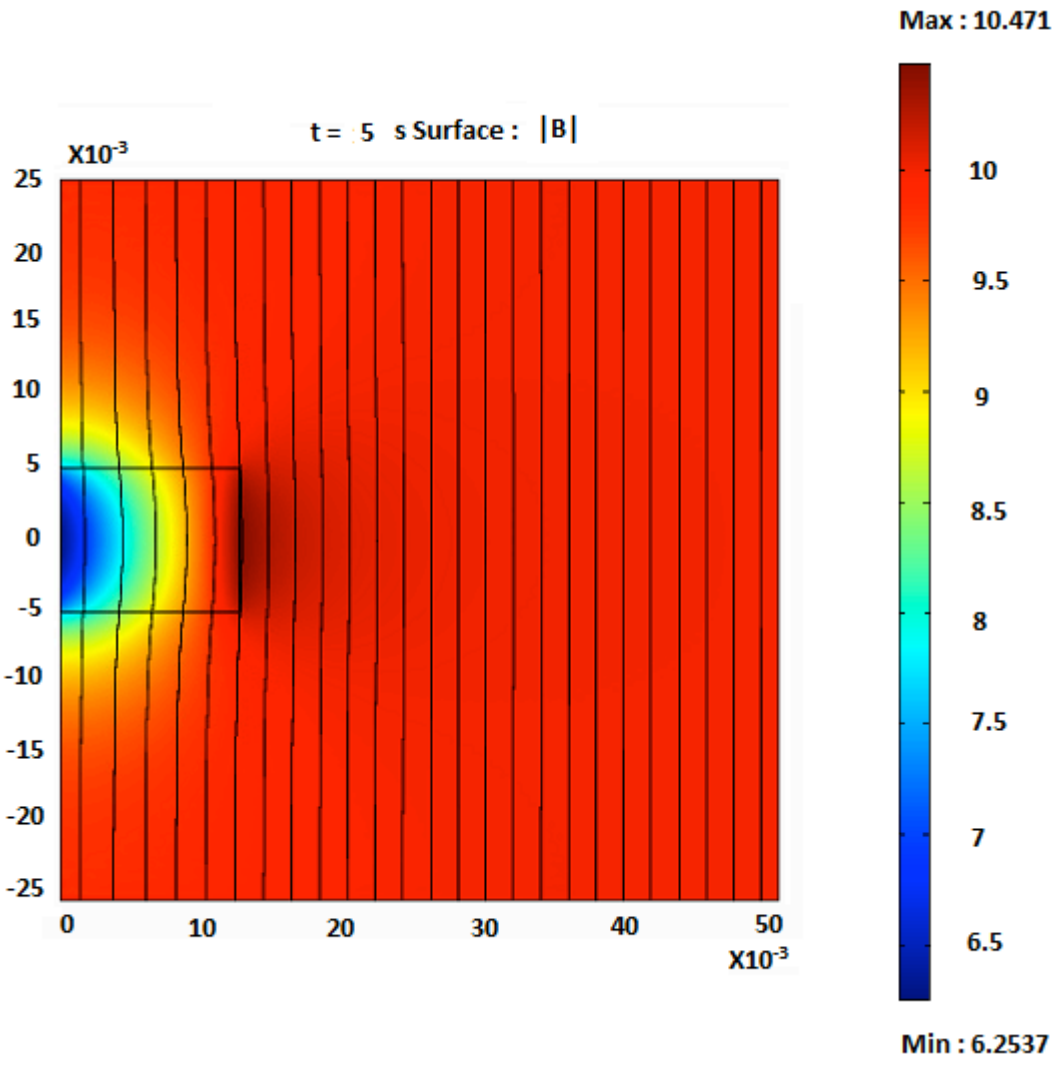


1.3 Magnetisation at t = t3

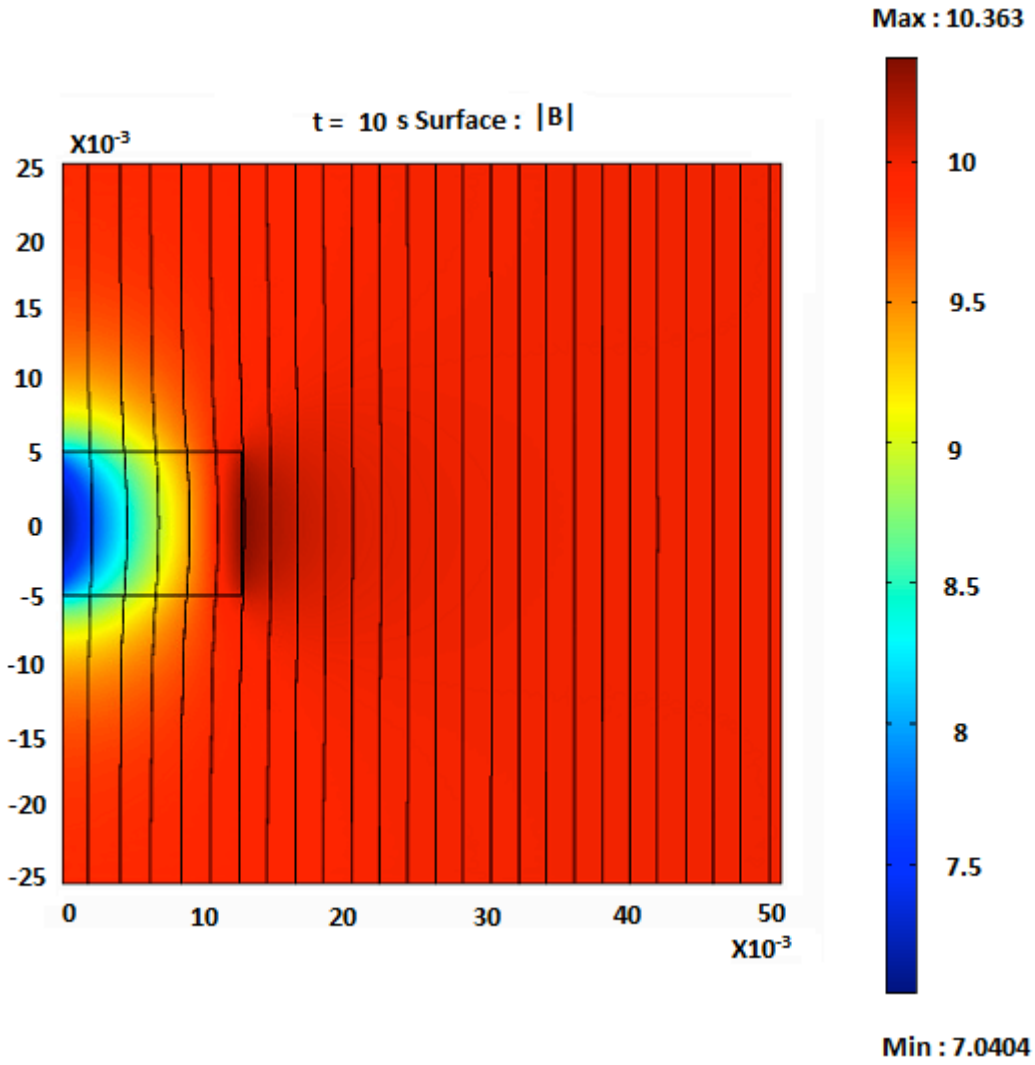


2. Magnetisation of bulk (with Bmax = 10 T)

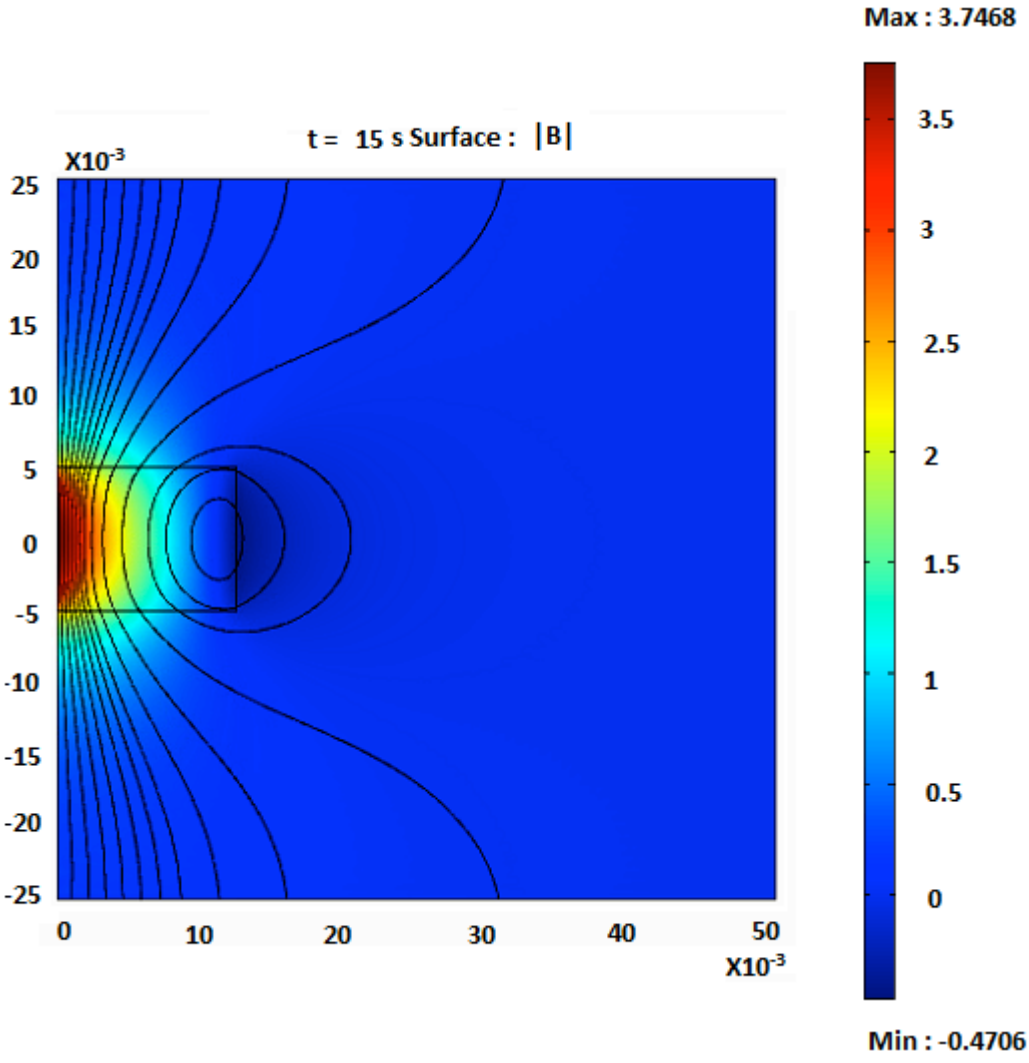
2.1 Magnetisation at t = t1



2.2 Magnetisation at t = t2



2.3 Magnetisation at t = t3



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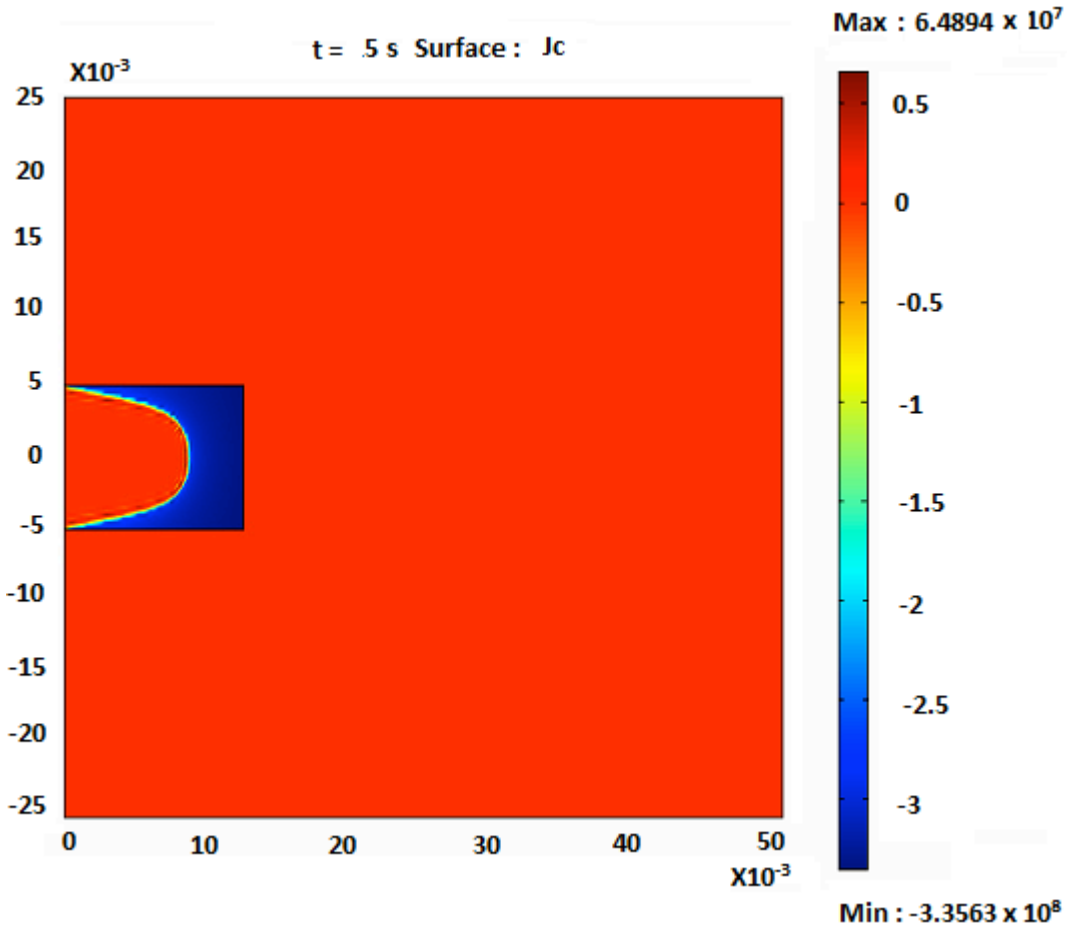
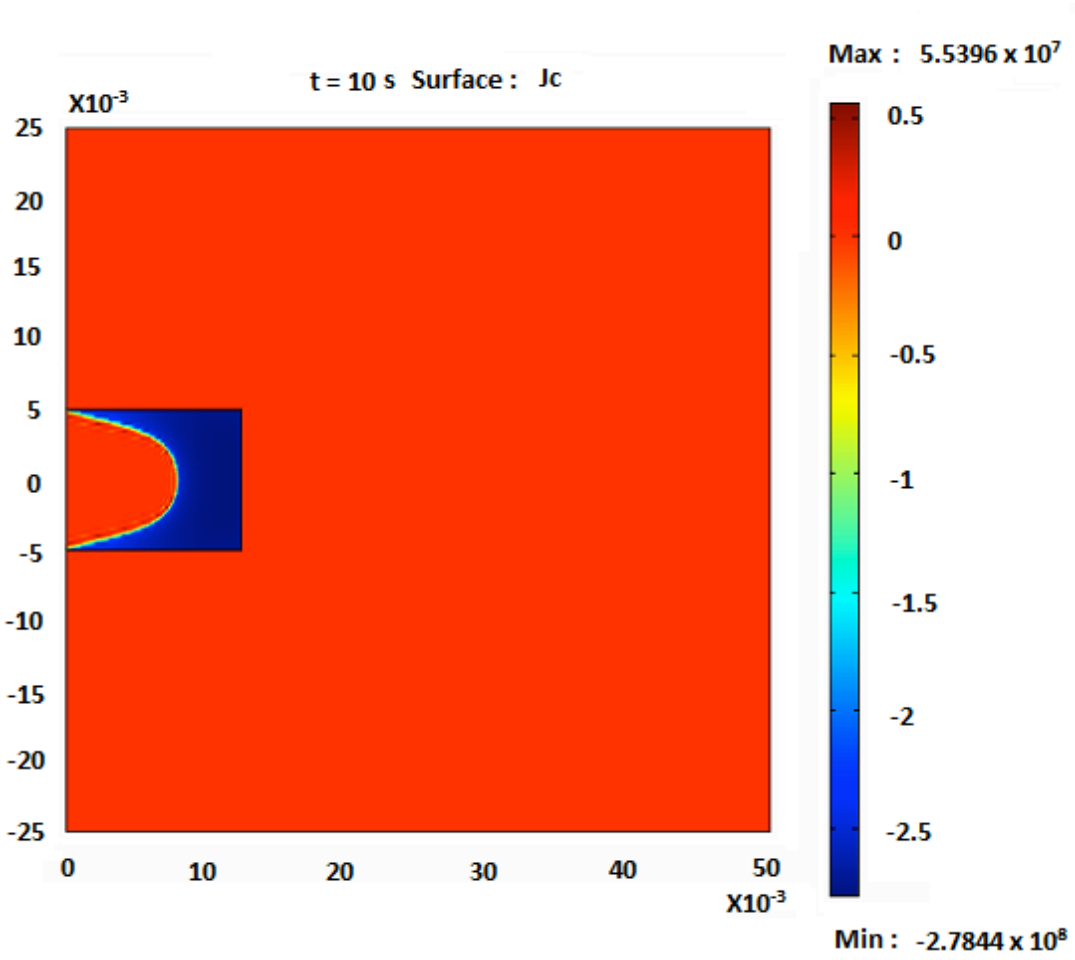
3. Jc distribution of bulk (with Bmax = 1 T)

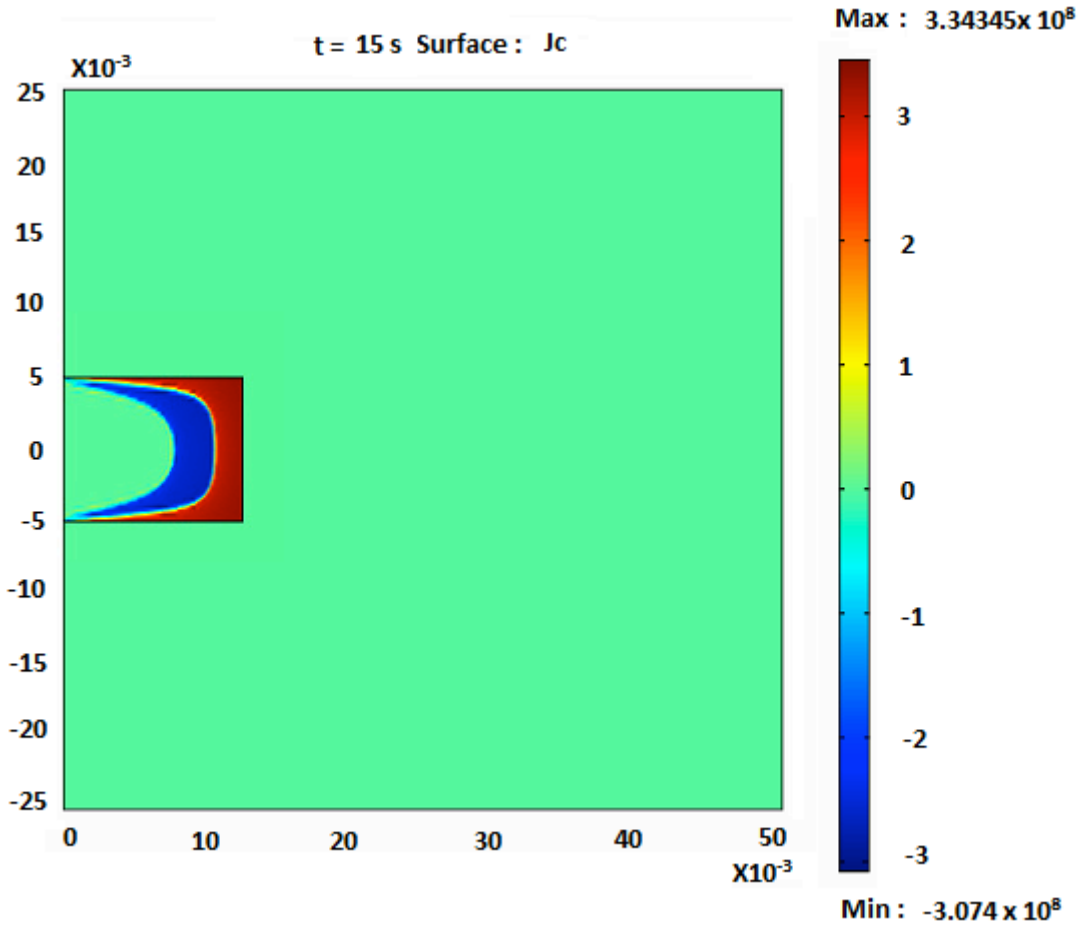
3.1 Jc distribution at t = t1



3.2 Jc distribution at t = t2

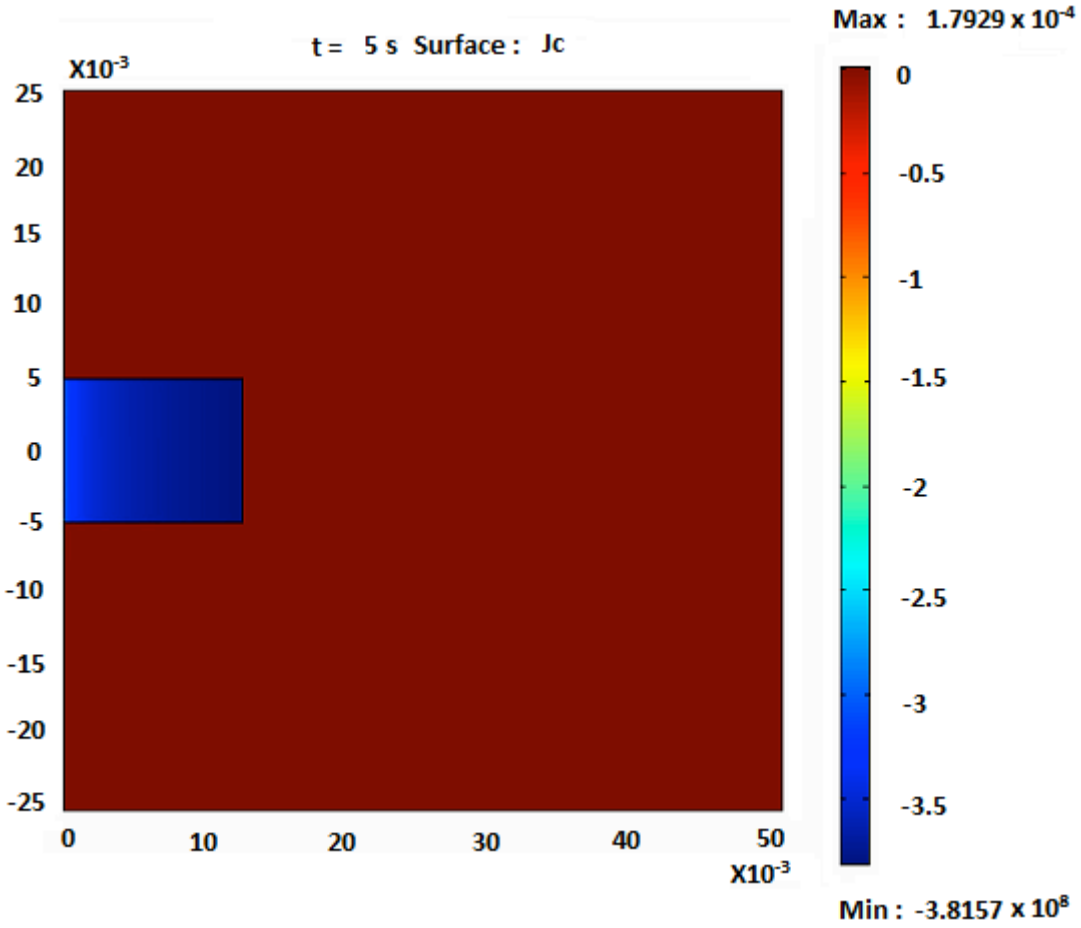


3.3 Jc distribution at t = t3

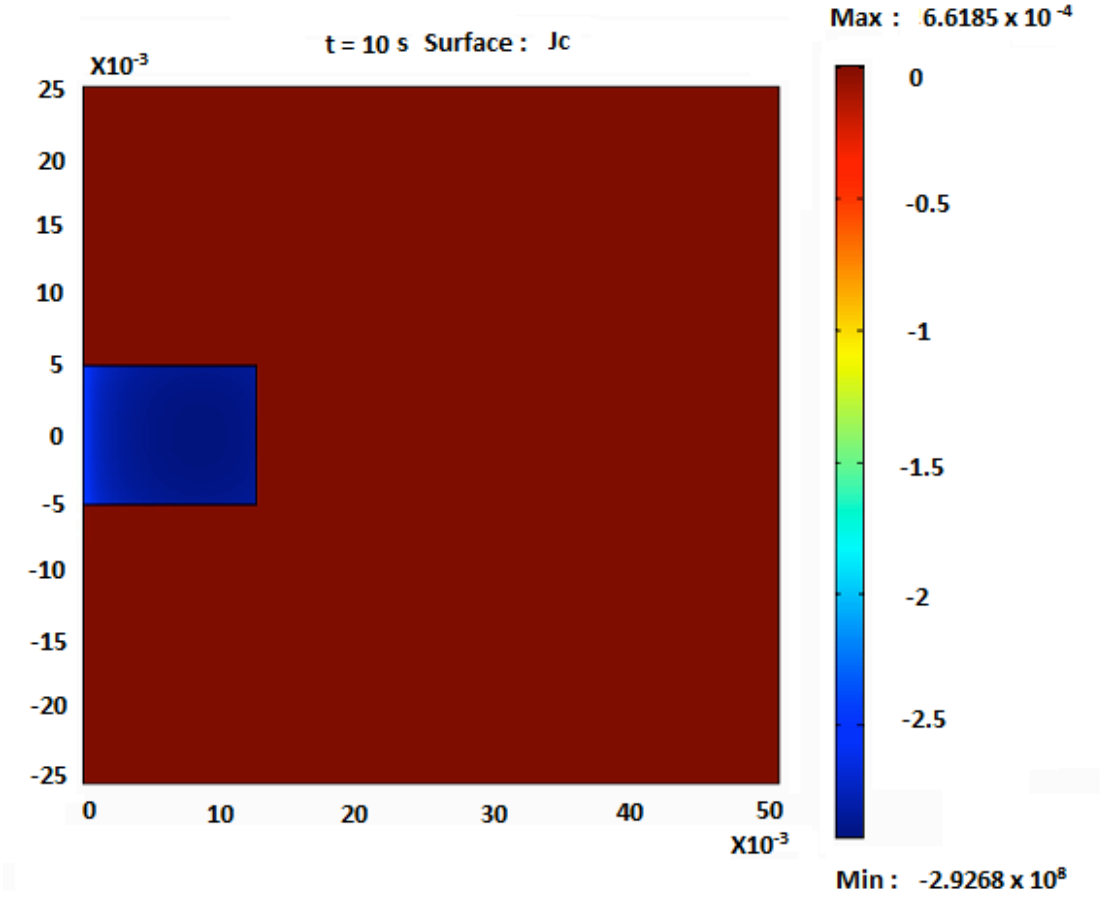


4. Jc distribution of bulk (with Bmax = 10 T)

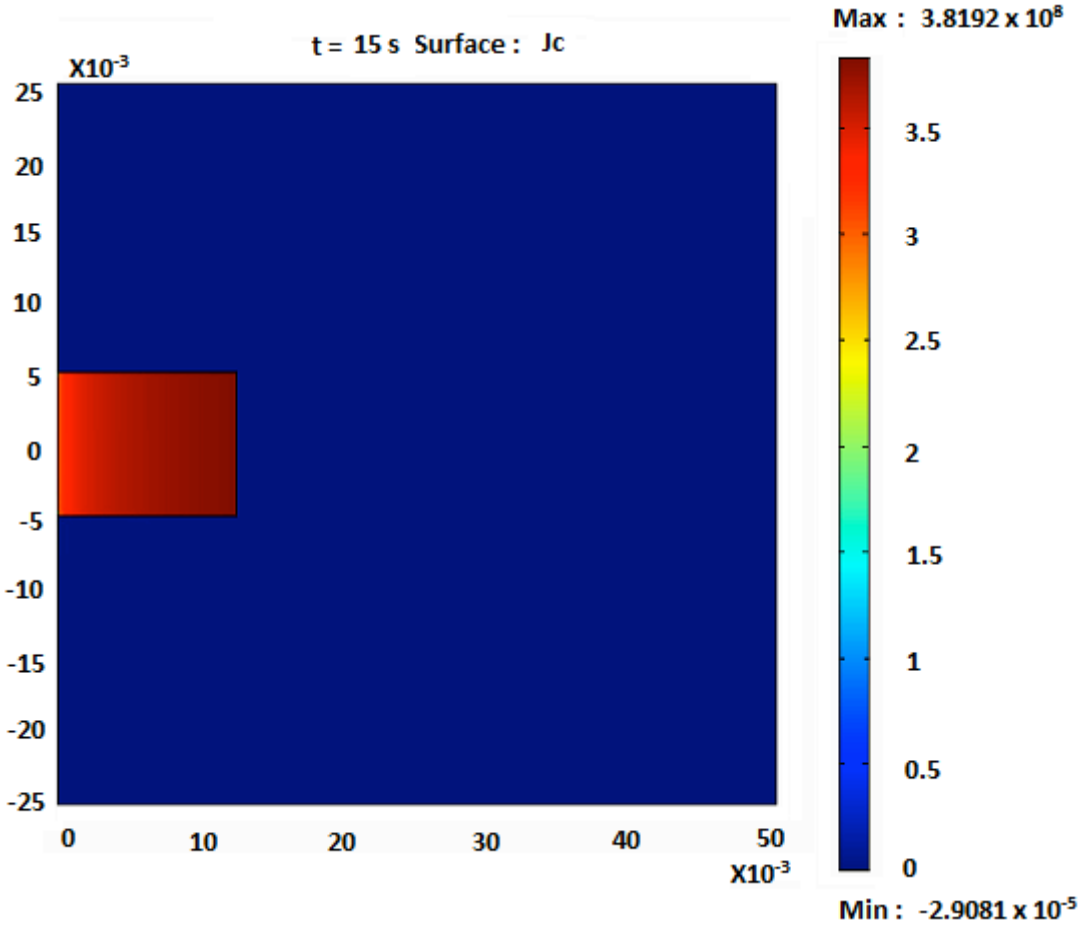
4.1 Jc distribution at t = t1



4.2 Jc distribution at t = t2

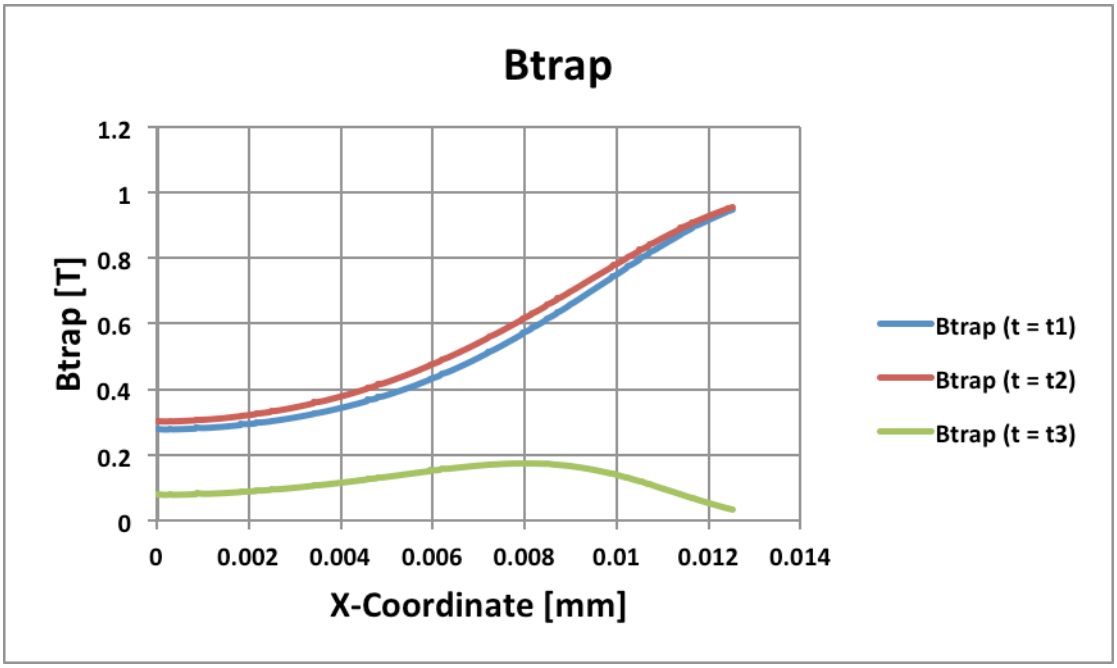


4.3 Jc distribution at t = t3



5. Trapped field

5.1 Btrap with Bmax = 1 T



5.1 Btrap with Bmax = 10 T