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These Matlab programs realize solution of the magnetic lens example in [1]; the employed dimensionless variables are also defined there.

**main\_lens.m** – the main program;

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**lens\_geom.m** – defines the geometry and rectangular grid, is called from the main program, and can be easily replaced for a different geometry. If the outer to the sc domain is contourwise simply connected, no cuts are needed and the returned list of the cut grid

nodes, ind\_cut, should be the empty matrix.

**rho\_sc\_iso\_fun.m** – defines the nonlinear resistivity of the sc in the current-voltage relation

. In this example ; in general  can be anisotropic, field dependent, etc.

Outside the sc (including the cuts) it sets . This function call is specified in the

main program as a string which is given to **RHS\_3D\_SC** as a parameter and evaluated

there. No changes in **RHS\_3D\_SC** are needed to change the  law for the sc.

**RHS\_3D\_SC.m** – computes the right hand side of the ODE system; is called by the ODE solver.

**curl\_fun.m** – computes the curl of a 3D vector field and also the induced magnetic field

(depending on the input arguments) ; is called from **RHS\_3D.m**

**dHa**.**m** – returns the uniform external magnetic field  and its time derivative; is called by

**RHS\_3D.m**

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**pl\_sl\_lens.m** and the called from it **lens\_frame.m** – m-files used to plot the results, are specific to this example.

[1] L. Prigozhin and V. Sokolovsky “Fast Fourier Transform Based Method for 3D Simulation of Superconducting Magnetic Shields and Lenses”.

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