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% Initialize COMSOL Model
model = comsol.ModelUtil.create('Model');
model.modelPath('C:\COMSOL\MagneticFieldSimulation');

% Create 3D geometry (sphere to represent material)
geom1 = model.geom.create('geom1', 3);
geom1.feature.create('sph1', 'Sphere');
geom1.feature('sph1').set('r', '1e-3'); % Radius in meters

% Define material properties (using air and iron for example)
mat1 = model.material.create('mat1', 'Common');
mat1.propertyGroup('def').set('mu', {'1', '1e-5'}); % Relative
permeability

% Add Magnetic Fields (mf) physics
mf = model.physics.create('mf', 'MagneticFields', 'geom1');
mf.feature.create('f1', 'MagneticField', 3);
mf.feature('f1').set('B0', [0, 0, 1e5]); % Uniform magnetic
field in z-direction

% Set boundary conditions (magnetic insulation on boundary)
mf.feature.create('b1', 'Boundary', 2);
mf.feature('b1').set('BoundaryType', 'MagneticInsulation');

% Mesh the geometry
mesh1 = model.mesh.create('mesh1', 'geom1');
mesh1.autoMeshSize(2); % Set mesh size for better accuracy

% Run the simulation
study1 = model.study.create('std1');
study1.feature.create('stat', 'Stationary');
study1.run;

% Plot the magnetic field results
model.result.create('pg1', 'PlotGroup3D');
model.result('pg1').create('surfl', 'Surface');
model.result('pg1').feature('surfl').set('expr', 'mf.B');
model.result('pg1').run;

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