# Problem set 05

# Problem 1

In the 5th chapter of the book is an example (Ex. 5.11 in the 4th edition) about how to calculate the vector potential $\mathbf{A}$ of a rotating uniformly charged spherical shell. Use the results of this example to calculate the magnetic field $\mathbf{B}$ inside a solid sphere with uniform charge distribution $\rho$. The sphere rotates with a constant angular velocity.

# Problem 2

Flat conductor parallel to the $x$-$y$-plane with $z$-coordinates restricted between $z = -a$ and $z = a$ carries a free current density $\mathbf{J} = J_0 \mathbf{a}_x$. The conductor has magnetic susceptibility $\chi_m = 0$. Outside the conductor is a linear magnetic material with susceptibility $\chi_m \neq 0$. Find everywhere $\mathbf{H}$, $\mathbf{B}$, $\mathbf{M}$ and the equivalent magnetization currents.

*The problem is due Monday February 17 2025 at 20:00*