

Discussion date: 18 November 2015

Exercise 1: Domain walls in the Ginzburg-Landau formalism.

In the lecture we discussed the domain wall for $\kappa \ll 1$. Here we want to find the solution for general κ numerically. This exercise will occupy two weeks.

Consider a domain wall interpolating between a normal metal and a superconductor. For the problems below, you will need to have the correct differential equation and boundary conditions. You will then have to use a numerical tool to (numerically) integrate the differential equation. The choice of programming language / tool for solving this problem is completely free.

week 1

- (a) Solve the case $\kappa \ll 1$, which was already discussed in the lecture, numerically.

Comment: Compare your numerical solution to the analytical solution from the lecture.

- (b) Set up the boundary value problem for general κ , i.e. including the magnetic field.

week 2

- (c) Solve the full boundary value problem for general κ numerically.