Computational Science 2

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Seminar
Exercises

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Exercise 1   (2.4.2019):

Equipotential lines

from ***An Introduction to Computer Simulation Methods***,
Chapter 10, Problem 10.6

a) Write a program that is based on `FieldLineApp` and `FieldLine` to draw some of the equipotential lines for the charge distributions of an electric dipole and an electric quadrupole. Use a mouse click to determine the initial position of an equipotential line. The equipotential calculation should stop when the line returns close to the starting point or after an unreasonable number of calculations. You should also kill the thread when the user moves a charge, hits the Reset button, or when the application terminates.

b) What would a higher density of equipotential lines mean if we drew lines such that each adjacent line differed from a neighboring one by a fixed potential difference?

c) Explain why equipotential surfaces never cross.