ETH
Eidgenössische Technische Hochschule Zürich
Swiss Federal Institute of Technology Zurich

Solid State Theory
Exercise 2

FS 15
PD V. Geshkenbein

Problem 2.1 Packing fractions

Suppose the centers of identical solid spheres lie on the points of the lattice and spheres of the neighboring points just touch, without overlapping (such arrangement of spheres is called a close-packing arrangement.) The packing fraction is the the ratio of spheres volume over the total volume. Find the packing fraction for the hcp, fcc, and diamond lattices.

Problem 2.2 Angle between the bonds in the diamond lattice

Find the angle between any two of the lines (bonds) joining a site of the diamond lattice.

Problem 2.3 Anisotropy of the hexagonal lattice

Show that the resistivity of the 2d hexagonal lattice is isotropic.