Abstract

Point Contact spectroscopy(PCS) is a well established and valued technique while study- ing electron interaction with various kinds of elementary excitations in the lattice. If the junction constriction diameter is made su ciently small such that the transport falls under ballistic limit, electron can be given high energies(large bias across the junction) without signi cant heating e ects (absence of scattering). These electrons at particular characteristic energies, in turn can excite the fundamental modes in the lattice structure, thus forming the basis of energy resolved spectroscopy. Consequently PCS acts as a local probe for the Fermi Surface in metals. PCS between metals and Superconductors at appropriate transport regimes gives us valuable information regarding the energy gap structure of the Superconductor. A wider scope of PCS theory allows us to determine the degree of transport spin polarization in a ferromagnet in a Superconductor-Ferromagnet point contact spectroscopy. Using a well known formalism by Blonder-Tinkham-Klapwijk for modelling Normal metal-Superconductor junctions, I have analysed the following ex- periments (1) Calculating the degree of transport spin polarization in the itinerant ferromagnet CuFeSb. (2) PCS in Pb-Ag and Pb-Co point contacts, where the di erential conductance spectra suggest possibility of spin triplet pairing in mesoscopic Pb-point contacts.