

Plenary Talk

PV VII Wed 9:45 e415

Quantum fluctuation mesoscopic approach to Josephson junctions — ●FABIO BENATTI — Department of Physics, University of Trieste, Strada Costiera 11, I-34151 Trieste, Italy

The quantum features of Josephson circuits are usually studied by modelling them as non-linear quantum oscillators. It will be discussed how such phenomenological approaches can be accounted for by means

of the theory of quantum fluctuations applied to the so-called strong-coupling quasi-spin version of the BCS Hamiltonian.

Within this formulation suitable quantum fluctuations, namely sums of microscopic quantum degrees of freedom scaling differently from the classical mean-field limits, provide mesoscopic degrees of freedom. These latter are at the same time macroscopic and behave quantumly; moreover, they evolve in time according to a Hamiltonian able to support a Josephson current.