

Thursday, December 19th, 12.00-13.00
Seminar Room at the Mathematics Department of UPV/EHU

Prof. Walter de Siqueira Pedra

Institute of Physics, University of São Paulo, Brasil

LARGE DEVIATIONS FOR WEAKLY INTERACTING FERMIONS AT EQUILIBRIUM - GENERATING FUNCTIONS AS BEREZIN INTEGRALS.

We prove that the Gaertner-Ellis generating functions associated with KMS states of weakly interacting fermions on the lattice can be written as the limit of logarithms of Gaussian Berezin integrals. The covariances of the Gaussian integrals are shown to have a uniform Pfaffian bound and to be summable in general cases of interest (including systems that are not translation invariant). The Berezin integral representation can thus be used to obtain convergent expansions of the generating function in terms of powers of its parameter. Because the results are uniform w.r.t. the free part of the interaction, they are relevant for the study of equilibrium correlations of weakly interacting fermions in random media (background potentials). In this context, a recent application on the accuracy of the macroscopic electric conductivity at microscopic scales will be discussed.