第 36 回トポロジカル物質科学セミナー
Topological Materials Science Seminar (36)

Low-frequency conductivity of disordered wires: integrability and instantons

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Place: **Meeting Room 435 & 437, Main Research Building, Wako Campus, RIKEN**
(理化学研究所 和光キャンパス 研究本館４階会議室 435&437)
Date: **March 23(Thursday), 2017**
Time: **13:00-14:00**

Abstract:

Generic states of non-interacting electrons in disordered wires are localized, and the DC conductivity of a wire vanishes at zero temperature. However, the AC conductivity is non-vanishing, and its general form at low frequency, was obtained by Mott who used intuitive qualitative arguments. Then this formula was rigorously obtained by Berezinsky for a strictly one-dimensional (1D) disordered system. Using optimal fluctuation (instanton) methods, we compute the AC conductivity for a model of a disordered quasi-1D wire at low frequencies and large negative energies. Such instanton techniques were applied to the 1D case by Hayn and John. After some surprising cancellations, we obtain the Mott-Berezinsky formula. The present model is special in its high degree of symmetry, and our calculation uses the integrability of the saddle-point equations in an essential way. We consider whether Mott-Berezinsky formula would survive the loss of these features.

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