
Lower critical dimension of the symplectic symmetry class in the Anderson localisation problem: Borel-Pade re-summation of the beta-function.

Keith Slevin*¹ and Yoshiki Ueoka¹

¹Osaka University – Japan

Abstract

In a previous work [1], we presented evidence that there is an Anderson transition below two dimensions in the symplectic universality class. Recently, this problem is the subject of renewed attention [2]. In a previous work [3], we have shown that the estimates of the critical exponent obtained in the non-linear sigma model formulation of the localisation problem are dramatically improved by incorporating in the Borel-Pade re-summation of the epsilon expansion for the critical exponent the asymptotic behaviour in high dimensions. In this paper [4], we will discuss the application of the Borel-Pade re-summation method directly to the beta functions of the Wigner-Dyson classes of the Anderson localisation problem. Examining the dimensionality dependence of the beta function allows us to estimate the lower critical dimension of the symplectic symmetry class.

Y. Asada, K. Slevin, and T. Ohtsuki, *Physical Review B* 73, 041102 (2006).

D. Sticlet and A. Akhmerov, *Physical Review B* 94, 161115 (2016).

Y. Ueoka and K. Slevin, *Journal of the Physical Society of Japan* 83, 084711 (2014).

Y. Ueoka. 2016. Some fundamental studies of critical phenomena of the Anderson transition in the Wigner-Dyson universality class. PhD thesis, Osaka University.

*Speaker