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CORRECTION TO: "INTERNAL LIFSHITS TAILS FOR RANDOM PERTURBATIONS OF PERIODIC SCHRÖDINGER OPERATORS"

FRÉDÉRIC KLOPP

In [1] we studied the existence of Lifshitz tails for internal gaps of a randomly perturbed periodic Schrödinger operator and concluded that, for both long-range and short-range single-site perturbation, one has Lifshitz tails at a band edge if and only if a suitably chosen underlying periodic operator has a nondegenerate density of states at the corresponding band edge. This result is correct only in the case of short-range potentials. In the case of long-range potentials, one finds that the Lifshitz tails hold without any assumptions on the underlying periodic potential.

More precisely, if one assumes only [1, (H.4)], then the results stated in [1, Th. 2.1] are correct.

If one assumes [1, (H.4s)], then the result stated in [1, Th. 2.1] in the case [1, (H.2bis(2))] is correct if one asks for a slightly faster decay, that is, if assumption [1, (H.2bis(2))] is replaced with

(H.2bis(2)) *there exists* $\nu > d+2$ *such that one has, for any* $\gamma \in \Gamma$ *and almost every* $x \in C_0$,

$$V > 0 \textit{ on some open set and } 0 \leq V(x+\gamma)\cdot(1+\mid \gamma \mid)^{\nu} \leq g_+(x). \quad (0.1)$$

In the case when one has, for any $\gamma \in \Gamma$ and almost every $x \in C_0$,

$$V > 0 \text{ on some open set and } 0 \leq V(x+\gamma)\cdot(1+\mid \gamma \mid)^{d+2} \leq g_+(x), \quad (0.2)$$

then the correct statement (which is proved in [1]) is

$$\lim_{E\to 0^+} \frac{\log(n(E)-n(0))}{\log E} = \frac{d}{2} \Longrightarrow \lim_{E\to 0^+} \frac{\log|\log(N(E)-N(0))|}{\log E} = -\frac{d}{2}. \quad (0.3)$$

Let us now state the correct result in the case of long-range single-site perturbations; that is, we assume

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