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Riesz bases of exponentials for domains that tile multiply with a lattice

Suppose Ω is a bounded, measurable set in Euclidean space which tiles space at some positive integer level k (almost every point is covered exactly k times) when translated at the locations of a lattice Λ. Grepstad and Lev showed that such domains have a Riesz basis of exponentials, provided they have a boundary of 0 measure. Their method used results of Matei and Meyer on quasicrystals. We prove the same result (without the requirement for null boundary) using a different argument based mostly on linear algebra. Open problems are discussed.