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Peter Christopher Leslie Humphries* (pclhumphries@gmail.com). *Small Scale Equidistribution of Lattice Points on the Sphere.*

Consider the projection onto the unit sphere in \mathbb{R}^3 of the set lattice points $(x_1, x_2, x_3) \in \mathbb{Z}^3$ lying on the sphere of radius \sqrt{n} . Duke and Schulze-Pillot showed in 1990 that these points equidistribute on the sphere as $n \rightarrow \infty$. We study a small scale refinement of this theorem, where one asks whether these points equidistribute in subsets of the sphere whose surface area shrinks as n grows. A particular case of this is a conjecture of Linnik, which states that for all $\varepsilon > 0$, the equation $x_1^2 + x_2^2 + x_3^2 = n$ has a solution with $|x_3| < n^\varepsilon$ for all sufficiently large n . We make nontrivial progress towards this and also prove an averaged form of this conjecture. This is joint work with Maksym Radziwiłł. (Received August 21, 2019)