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Badly approximable vectors on a vertical Cantor set

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For $i, j > 0, i + j = 1$, the set of badly approximable vectors with weight (i, j) is defined by $Bad(i, j) = \{(x, y) \in \R^2 : \exists c > 0 \forall q\in\N, \;\; \max\{q||qx||^{1/i}, q||qy||^{1/j} \} > c\}$, where $||x||$ is the distance of x to the nearest integer. In 2010 Badziahin-Pollington-Velani solved Schmidt's conjecture which was stated in 1982, proving that $Bad(i, j) \cap Bad(j, i)$ is nonempty. Using Badziahin-Pollington-Velani's technique with reference to fractal sets, we were able to improve their results: Assume that we are given a sequence (i_t, j_t) with $i_t, j_t > 0, i_t + j_t = 1$. Then, the intersection of $Bad(i_t, j_t)$ over all t is nonempty.

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