

Hyperplane Absolute Winning Property of Bounded Orbits under Diagonalizable Flows on $SL_3(\mathbb{C})/SL_3(\mathcal{O}_{\mathbb{K}})$

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ABSTRACT

In his seminal work relating metric topological games with Diophantine approximation, Schmidt showed that the real numbers badly approximable by the rationals form a set of zero Lebesgue measure yet full Hausdorff dimension. A correspondence between badly approximable numbers and bounded orbits of diagonalizable flows on homogeneous spaces was established by Dani. Bounded orbits of diagonalizable flows have been studied by An, Guan and Kleinbock for $SL_3(\mathbb{R})/SL_3(\mathbb{Z})$. We extend these results to $SL_3(\mathbb{C})/SL_3(\mathcal{O}_{\mathbb{K}})$, where \mathbb{K} is an imaginary quadratic field. We achieve this by setting up an appropriate variant of the Schmidt game in \mathbb{C}^3 such that the bounded orbits under the above-mentioned flow on $SL_3(\mathbb{C})/SL_3(\mathcal{O}_{\mathbb{K}})$ correspond to a particular set of vectors in \mathbb{C}^3 that is hyperplane absolute winning relative to an approximation by the imaginary quadratic rationals in \mathbb{K} .

Keywords: Schmidt Games; Rational Approximation

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