In this paper the authors construct an increasing sequence of natural numbers \((m_n)_{n=1}^{\infty}\) and a measure \(\nu\) on \(T\) with the following properties:

1. For any irrational \(\theta\), the sequence of fractional parts \((m_n\theta)_{n=1}^{\infty}\) is dense in \(T\);
2. For any \(k \in \mathbb{N}\) there are infinitely many \(n\) such that \(k\) is not a factor of \(m_n\) (reviewer's note: except, of course, for \(k = 1\));
3. \(\lim_{n \to \infty} \int_T \|m_n\theta\| d\nu(\theta) = 0\).

The first two conditions guarantee that the sequence \(m_n\) cannot be a rigidity sequence of any irrational or rational circle rotation (note: other than the identity map). The construction of the sequence is based on a generalization of a theorem in a previous paper of the first author and J.-P. Thouvenot [Acta Arith. 165 (2014), no. 4, 327–332; MR3268705]. The final condition ensures the existence of a weakly mixing system with \((m_n)\) as a rigidity sequence.

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References


Note: This list reflects references listed in the original paper as accurately as possible with no attempt to correct errors.

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