Shadowing and inverse shadowing in group actions

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In this talk, we discuss shadowing and inverse shadowing in actions of some finitely generated groups.

The shadowing property means that, given an approximate trajectory, we can find an exact trajectory close to it. The Reductive Shadowing Theorem (RST) states that if Φ is a uniformly continuous action of a finitely generated group G and the action of a one-dimensional subgroup of G is topologically Anosov (i.e., it has the shadowing property and is expansive), then the action Φ is topologically Anosov as well (and hence, Φ has the shadowing property).

The first RST was proved in [1] for the groups $\mathbf{Z}^p$; later it was proved for virtually nilpotent groups [2]. At the same time, it was shown in [2] that the RST is not valid for the Baumslag–Solitar groups $\mathrm{BS}(1,n)$ with $n > 1$.

The inverse shadowing property means that, given a family of approximate trajectories (generated by a so-called approximate method), we can find a member of this family that is close to any chosen exact trajectory. It is shown in [3] that an analog of the RST for the case of inverse shadowing (with "topologically Anosov" replaced by the so-called "Tube Condition") is also valid for virtually nilpotent groups.

References

1. *Pilyugin S. Yu., Tikhomirov S.B.* Shadowing in actions of some abelian groups // Fund. Math. 2003. V. 179, N 1. P. 83–96.
2. *Osipov A. V., Tikhomirov S.B.* Shadowing for actions of some finitely generated groups // Dyn. Syst. 2014. V. 29, N 3. P. 337–351.
3. *Pilyugin S. Yu.* Inverse shadowing in group actions // Dyn. Syst. 2016.