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Irreducible automorphisms of F_n have north-south dynamics on compactified outer space. (English) Zbl 1034.20038

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Let F_n be the non-Abelian free group of rank n. In their study of the outer automorphism group $\mathrm{Out}(F_n)$ of F_n, Culler and Vogtmann defined a moduli space CV_n of marked graphs, called 'outer space', which is finite dimensional, contractible and which has a spine which admits a discrete co-compact action with finite point stabilizers of $\mathrm{Out}(F_n)$. *M. Bestvina* and *M. Handel*, in their study of the automorphisms of F_n, introduced in their paper [Ann. Math. (2) 135, No. 1, 1-51 (1992; Zbl 0757.57004)] an analogue of Thurston's pseudo-Anosov maps, and they called these maps "irreducible automorphisms" of F_n.

In the paper under review, the authors study the action of an irreducible automorphism on the closure $\overline{CV_n}$ of CV_n. They prove that if $\alpha \in \mathrm{Aut}(F_n)$ is irreducible with irreducible powers, then its action on $\overline{CV_n}$ has north-south dynamics. In other words, there exist two points $[T^+]$ and $[T^-]$ in ∂CV_n such that $\alpha^p([T]) \to [T^+]$ as $p \to \infty$ for all $[T] \neq [T^-]$ and $\alpha^{-p}([T]) \to [T^-]$ as $p \to \infty$ for all $[T] \neq [T^+]$. This property is an analog of a property of the action of a pseudo-Anasov mapping class on Thurston's compactification of Teichmüller space.

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MSC:

20F65 Geometric group theory
20E05 Free nonabelian groups
20E36 Automorphisms of infinite groups
20E08 Groups acting on trees
57M07 Topological methods in group theory

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