

Fluch, Martin G.; Marschler, Marco; Witzel, Stefan; Zaremsky, Matthew C. B.
The Brin-Thompson groups sV are of the type F_∞ . (English) [Zbl 1292.20045](#)
Pac. J. Math. 266, No. 2, 283-295 (2013).

The Brin-Thompson group sV , with $s \geq 2$, is a higher-dimensional generalization of the Thompson group V , acting on an s -dimensional cube. The paper under review shows that these groups are of type F_∞ , i.e. they admit a classifying space with finitely many cells in each dimension. This result was previously known only for $s \leq 3$ [*D. H. Kochloukova et al.*, *Proc. Edinb. Math. Soc.*, II. Ser. 56, No. 3, 777-804 (2013; [Zbl 1294.20065](#))].

The proof, similarly as in the case of $s \leq 3$, is based on Brown's criterion [*K. S. Brown*, *J. Pure Appl. Algebra* 44, 45-75 (1987; [Zbl 0613.20033](#))], which states that if a group G acts on a contractible CW-complex X with a filtration $\{X_j\}_{j \geq 1}$ in such a way that X_j/G are finite, the connectivity of the pair (X_{j+1}, X_j) tends to ∞ , and the stabilizers of cells are of type F_∞ , then G itself is of type F_∞ . Kochloukova et al. used the action of sV on the geometric realization of a certain natural poset, which becomes increasingly difficult to analyze with growing s . The authors of the paper overcome this difficulty by finding a subcomplex sX of this realization, which they call the Stein space. The advantage they obtain is easier discrete Morse theory, which is used to establish a lower bound on connectivity.

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MSC:

[20F65](#) Geometric group theory
[20E32](#) Simple groups
[20J05](#) Homological methods in group theory
[57Q12](#) Wall finiteness obstruction for CW-complexes
[57M07](#) Topological methods in group theory

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