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**Nikolay Brodskiy\*** ([nbrodski@utk.edu](mailto:nbrodski@utk.edu)), University of Tennessee, Department of Mathematics, 227 Ayres Hall, Knoxville, TN 37919. *Dimension and decomposition complexity of tree-graded spaces.*

In attempts to capture asymptotic properties of finitely generated groups, manifolds, and general metric spaces, various dimension properties have been introduced, including asymptotic dimension and asymptotic dimension growth (Gromov), asymptotic property C (Dranishnikov) and asymptotic property D (Dydak). Further generalizations include Finite Decomposition Complexity (Guentner, Tessera, Yu) and Straight Finite Decomposition Complexity (Dranishnikov, Zarichnyi). We prove that if  $X$  is a tree-graded space (as introduced by Drutu and Sapir) and the family of all pieces of  $X$  satisfies a dimension or decomposition property uniformly, then  $X$  satisfies that property, with explicit control over the parameters used in the property. In particular, the free product of finitely generated groups  $G * H$  satisfies a dimension or decomposition property if the property holds for each group  $G$  and  $H$ . (Received January 26, 2019)