

THE TORIC h -VECTOR OF A CUBICAL
COMPLEX IN TERMS OF NONCROSSING
PARTITION STATISTICS

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Abstract

This paper introduces a new and simple statistic on noncrossing partitions that expresses each coordinate of the toric h -vector of a cubical complex, written in the basis of the Adin h -vector entries, as the total weight of all noncrossing partitions. The same model may also be used to obtain a very simple combinatorial interpretation of the contribution of a cubical shelling component to the toric h -vector. In this model, a strengthening of the symmetry expressed by the Dehn-Sommerville equations may be derived from the self-duality of the noncrossing partition lattice, exhibited by the involution of Simion and Ullman.

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