

1112-05-442

Benjamin Braun* (benjamin.braun@uky.edu), **Matthias Beck**, **Matthias Koeppel**, **Carla D. Savage** and **Zafeirakis Zafeirakopoulos**. *Generating functions and triangulations for lecture hall cones*. Preliminary report.

We investigate the arithmetic-geometric structure of the lecture hall cone

$$L_n := \left\{ \lambda \in R^n : 0 \leq \frac{\lambda_1}{1} \leq \frac{\lambda_2}{2} \leq \frac{\lambda_3}{3} \leq \dots \leq \frac{\lambda_n}{n} \right\}.$$

We show that L_n is isomorphic to the cone over the lattice pyramid of a reflexive simplex whose Ehrhart h^* -polynomial is given by the $(n-1)$ st Eulerian polynomial, and prove that lecture hall cones admit regular, flag, unimodular triangulations. After explicitly describing the Hilbert basis for L_n , we conclude with observations and a conjecture regarding the structure of unimodular triangulations of L_n , including connections between enumerative and algebraic properties of L_n and cones over unit cubes. (Received August 10, 2015)