

LORENTZIAN POLYNOMIALS ON CONES

IN COLLABORATION WITH JUNE HUH AND JONATHAN LEAKE

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ABSTRACT. June Huh and the author introduced multivariate Lorentzian polynomials as a framework to prove positivity and log-concavity results in combinatorics and algebra. This was used to prove Mason's strongest conjecture on the log-concavity of the independent set numbers of a matroid. In a recent work joint with Jonathan Leake, we extend this theory to Lorentzian polynomials on cones. This is used to give an elementary and short proof of the Heron-Rota-Welsh conjecture on the log-concavity of the coefficients of the characteristic polynomial of a matroid (first proved by Adiprasito, Huh and Katz).

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