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Matthias Lenz* (lenz@math.tu-berlin.de), Technische Universität Berlin, MA 4-5, Strasse des
17. Juni 136, 10623 Berlin, Germany. *Zonotopal Algebra, Power Ideals, and Log-Concavity.*

Zonotopal algebra is the study of several classes of graded vector spaces of polynomials that can be assigned to a realization of a matroid. Those spaces can be described as inverse systems of power ideals. Their Hilbert series are matroid invariants.

In the first part of the talk, we introduce *hierarchical zonotopal power ideals*. This extends and unifies results by Ardila-Postnikov, Holtz-Ron, and Holtz-Ron-Xu.

In the second part, we explain the relationship between zonotopal algebra and various matroid/graph polynomials. In addition, we show that log-concavity of the coefficients of the characteristic polynomial (recently proved by Huh and Katz for realizable matroids) implies log-concavity of the f -vector of the independence complex of matroids. (Received July 27, 2011)