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Anastasia Chavez* (anachavez@math.ucdavis.edu), **Jesus A. De Loera**, **Gennadiy Averkov**, **Bryan Gillespie** and **Yuanbo Li**. *Lattices and vector spaces generated by cycles of a graph.*

The cycles of a graph G generate the combinatorial object L_G , an integral lattice we call the lattice of cycles of G . This lattice lives inside the real vector space V_G generated by the indicator vectors of the cycles of G . Studying these objects is motivated by the simplicity that a convex geometry perspective can offer for several open questions in graph theory. For example, the Cycle Double Cover conjecture asserts any graph G has a cycle covering such that every edge of G is contained in exactly two cycles. In terms of lattices, this simplifies to the equivalent statement that $(2, \dots, 2) \in L_G$ for all G . In this talk, we describe some properties of the lattice and vector space generated by cycles of an undirected graph. This is joint work with Gennadiy Averkov, Jesus A. De Loera, Bryan Gillespie, and Yuanbo Li. (Received January 24, 2019)