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Zachary Greif and **Jason McCullough*** (jmccullo@iastate.edu). *Linear Syzygies of Toric Edge Ideals of Bipartite Graphs.*

Let G be a finite, simple, bipartite graph and let K be a field. We consider the toric edge ideal of G , defined as the defining ideal of the K -algebra generated by all quadratic monomials associated to edges of G . Hibi and Ohsugi showed that G is generated by quadratic binomials if and only if G is chordal bipartite. We extend their result by giving a combinatorial characterization of graphs whose toric edge ideal is generated by quadratics and has linear first syzygies. I will discuss connections between this result and a question of Varbaro regarding the existence of families of quadratic ideals with linear syzygies and regularity growing linearly with embedding dimension. (Received August 26, 2018)