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Hein van der Holst* (hvanderholst@gsu.edu), Atlanta, GA 30303, and **Serguei Norine** and **Robin Thomas**. *Decomposing 2-cycles*.

For a graph $G = (V, E)$, a 2-cycle $A = [a_{e,f}]$ is an $E \times E$ matrix such that $a_{e,f} = 0$ if e and f have a common vertex, and each row and each column of A is a circulation on G . Examples of 2-cycles are 2-cycles coming from a pairs of disjoint cycles of G . Also on each subgraph of G that is a subdivision of K_5 or $K_{3,3}$, there is a 2-cycle. It had been a conjecture that each 2-cycle can be written as a sum of these types of 2-cycles. This has recently been disproved by Barnett. In this talk, we give a finite list of types of 2-cycles such that each 2-cycle is a sum of 2-cycles from this list. We also show that for Kuratowski-connected graphs, it suffices to have 2-cycles coming from pairs of disjoint cycles of G and 2-cycles on subgraphs of G that are subdivisions of K_5 or $K_{3,3}$. (Received January 18, 2016)