1035-05-341 **Sam Vandervelde*** (svandervelde@stlawu.edu), Dept of Math, Stat & CS, 23 Romoda Drive, Canton, NY 13617. *Level three graph sums.*

We will present several peculiar properties of graph sums, a novel tool in the study of multigraphs. Briefly put, a level n graph sum is obtained by considering all n-colorings of the (labeled) vertices of a given multigraph G. To each edge we associate a certain nth root of unity based on the colors of its endpoints, then take the product over all edges in G. Summing this quantity over all n-colorings gives the value of the graph sum. We will focus on the case $n = 3$, with the goal of demonstrating that exactly 81 of the 729 possible level three graph sums have the property that the algebraic norm of the graph sum value is always a power of 3. We will also present preliminary findings and conjectures when $n \geq 4$. (Received September 03, 2007)