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Jackson Autry, Christopher O'Neill, Vadim Ponomarenko*

(vponomarenko@mail.sdsu.edu) and **Samuel Yih**. *Graph Realization for Atomic Simplexes*.

A numerical semigroup is a cofinite subset of \mathbb{N}_0 , closed under addition, including 0. These are well-studied, and we propose a new construction lending insight into their structure. Among their properties is a finite set of atoms, out of which each semigroup element may be built. Given numerical semigroup S and element $n \in S$, we build a simplicial complex on the set of atoms, based on which subsets of semigroup atoms may have their sum subtracted from n with the result in S . This work, done in an REU program primarily by undergraduates, considers the question of which ordinary graphs can appear as simplicial complexes in the manner described above. (Received September 13, 2017)