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Lindsay Eakins and **Thomas Fleming***, t1fleming@ucsd.edu, and **Thomas Mattman**.

Maximal Knotless Graphs.

A graph G is intrinsically knotted if every spatial embedding of G contains a cycle that forms a nontrivial knot. A graph G is maximal knotless if G is not intrinsically knotted, and there exists no way to add an edge to G so that the resulting graph is also not intrinsically knotted. We will provide a bound on the minimum number of edges required to form a maximal knotless graph on n vertices, and discuss a method for combining two maximal knotless graphs to form a larger one. Using this gluing construction and our classification of maximal knotless graphs up to 9 vertices or 20 edges, for any $n \geq 20$ we are able to produce maximal knotless graphs with n edges, except when $n = 22$. We will also present an infinite family of maximal knotless graphs that cannot be constructed by gluing. (Received September 18, 2021)