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*The Isolation Lemma*

A cycle  $C$  of a graph  $G$  is *isolating* if every component of  $G - V(C)$  consists of a single vertex. We show that isolating cycles in polyhedral graphs can be extended to larger ones: every isolating cycle  $C$  of length  $6 \leq |E(C)| < \lfloor \frac{2}{3}(|V(G)| + 4) \rfloor$  implies an isolating cycle  $C'$  of larger length that contains  $V(C)$ . By “hopping” iteratively to such larger cycles, we obtain a powerful and very general inductive motor for proving long cycles and computing them (in quadratic runtime).

This is joint work with Jan Kessler.