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## INDUCED ERDŐS-PÓSA PROPERTY FOR LONG HOLES, THETAS, AND BEYOND

We say that a family of graphs has the Erdős-Pósa property if for some graph  $H$  belonging to this family we have the following: every graph  $G$  and  $k$ ,  $G$  either admits  $k$  disjoint copies of  $H$ , or we can delete a set  $X$  of cardinality  $f(k)$  such that  $G - X$  is  $H$ -minor-free. In our work, we study the induced Erdős-Pósa property, where we require the copies of  $H$  to be not only vertex-disjoint but also anti-adjacent. We also assume a more natural definition of a small hitting set: instead of hitting the objects with a set  $X$ , we do it with the neighborhood of a few vertices, namely  $N[X]$ .

We show that long induced cycles and long induced thetas admit the induced Erdős-Pósa property, which resolves a special case of a conjecture of Ahn, Gollin, Huynh, and Kwon.

We also prove that graphs excluding  $k$  long induced thetas as induced minors admit balanced separators consisting of the neighborhood of  $\mathcal{O}(tk \log k)$  vertices. This, in turn, resolves a special case of a conjecture of Gartland and Lokshtanov and, combined with known techniques, yields a QPTAS for Maximum Weight Independent Set in this class of graphs, as well as for the problem of finding a largest induced subgraph of bounded treewidth satisfying a hereditary CMSO<sub>2</sub> formula.

This is joint work with Tomáš Masařík, Marcin Pilipczuk, Amadeus Reinald, and Paweł Rzążewski.