Minimum degree conditions for powers of cycles and paths

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The study of conditions on vertex degrees in a host graph G for the appearance of a target graph H is a major theme in extremal graph theory. The k^{th} power of a graph G is obtained from G by joining any two vertices at distance at most k. We study minimum degree conditions under which a graph G contains the k^{th} power of cycles and paths of arbitrary specified lengths. We determine precise thresholds, assuming that the order of G is large. This extends a result of Allen, Böttcher and Hladký [1] concerning the containment of squared paths and squared cycles of arbitrary specified lengths and settles a conjecture of theirs in the affirmative.

[1] Peter Allen, Julia Böttcher, and Jan Hladký. Filling the gap between Turán's theorem and Pósa's conjecture. *J. Lond. Math. Soc. (2)*, 84(2):269–302, 2011.