Outdegree conditions forcing directed cycles

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In 2010, Kelly, Kühn and Osthus [2] made a conjecture on the minimum semidegree which forces an oriented graph to contain a directed cycle of a given length at least 4. The conjecture was proven by its authors for cycles of length not divisible by 3 and in [1] for other cycles. We consider an analogous problem, but without the assumption on the minimum indegree, and prove an optimal bound on the minimum outdegree which forces an oriented graph to contain a directed cycle of a given large enough length.

References

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[2] L. Kelly, D. Kühn, D. Osthus, Cycles of given length in oriented graphs, *J. Combin. Theory Ser. B* 100 (2010), 251–264.