

# Linkedness and ordered cycles in directed graphs

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## Abstract

Given a digraph  $D$ , let  $\delta^0(D) := \min\{\delta^+(D), \delta^-(D)\}$  be the minimum semi-degree of  $D$ . We show that every sufficiently large digraph  $D$  with  $\delta^0(D) \geq n/2 + \ell - 1$  is  $\ell$ -linked. The bound on the minimum semi-degree is best possible and confirms a conjecture of Manoussakis from 1990. We also determine the smallest minimum semi-degree which ensures that a sufficiently large digraph  $D$  is  $k$ -ordered, i.e. that for every sequence  $s_1, \dots, s_k$  of distinct vertices of  $D$  there is a directed cycle which encounters  $s_1, \dots, s_k$  in this order. In fact, we prove that the latter semi-degree even ensures  $D$  to be  $k$ -ordered Hamiltonian. This is joint work with Daniela Kühn and (for the Hamiltonicity result) Andrew Young.