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The number of out-pancyclic vertices in a strong tournament. (English) Zbl 1298.05144

Graphs Comb. 30, No. 5, 1163-1173 (2014).

Summary: An arc in a tournament T with $n \geq 3$ vertices is called pancyclic, if it belongs to a cycle of length l for all $3 \leq l \leq n$. We call a vertex u of T an out-pancyclic vertex of T, if each out-arc of u is pancyclic in T. *T. Yao* et al. [Discrete Appl. Math. 99, No. 1–3, 245–249 (2000; Zbl 0939.05045)] proved that every strong tournament contains an out-pancyclic vertex. For strong tournaments with minimum out-degree 1, Yao et al. [loc. cit.] found an infinite class of strong tournaments, each of which contains exactly one out-pancyclic vertex. In this paper, we prove that every strong tournament with minimum out-degree at least 2 contains three out-pancyclic vertices. Our result is best possible since there is an infinite family of strong tournaments with minimum degree at least 2 and no more than 3 out-pancyclic vertices.

MSC:

05C20 Directed graphs (digraphs), tournaments
05C38 Paths and cycles

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