ON THE CHUDNOVSKY-SEYMOUR-SULLIVAN CONJECTURE ON CYCLES IN TRIANGLE-FREE DIGRAPHS

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Abstract. For a simple digraph $G$ without directed triangles or digons, let $\beta(G)$ be the size of the smallest subset $X \subseteq E(G)$ such that $G \setminus X$ has no directed cycles, and let $\gamma(G)$ be the number of unordered pairs of nonadjacent vertices in $G$. In 2008, Chudnovsky, Seymour, and Sullivan showed that $\beta(G) \leq \gamma(G)$, and conjectured that $\beta(G) \leq \gamma(G)/2$. Recently, Dunkum, Hamburger, and Pór proved that $\beta(G) \leq 0.88\gamma(G)$. In this note, we prove that $\beta(G) \leq 0.8616\gamma(G)$.

Key words. Digraph, triangle free digraph, cycle, in-degree, out-degree.

AMS subject classifications. 05C20, 05C35, 05C38.

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