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Coloring digraphs containing no cycles with two blocks.

A cycle with two blocks, $c(k, \ell)$, is an oriented cycle which consists of two internally (vertex) disjoint directed paths of lengths at least k and ℓ , respectively, from a vertex to another one. In 2007, Addario-Berry, Havet and Thomassé asked if, given positive integers k and ℓ such that $k + \ell \geq 4$, any strongly connected digraph D containing no $c(k, \ell)$ has chromatic number at most $k + \ell - 1$.

We show that such digraph D has chromatic number at most $O((k + \ell)^2)$, improving the previous upper bound $O((k + \ell)^4)$ of Cohen, Havet, Lochet and Nisse. This is joint work with Seog-Jin Kim, Jie Ma and Boram Park.