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Danny Rorabaugh* (rorabaugh@mast.queensu.ca), **Claude Tardif**, **David Wehlau** and **Imed Zaguia**. *Arc Graphs and Free Distributive Lattices*.

The arc graph $\delta(G)$ of a digraph G is the digraph with the set of arcs of G as vertex-set, where the arcs of $\delta(G)$ join consecutive arcs of G . In 1981, Poljak and Rödl characterised the chromatic number of $\delta(G)$ in terms of the chromatic number of G when G is symmetric (i.e., undirected). In contrast, directed graphs with equal chromatic numbers can have arc graphs with distinct chromatic numbers. Even though the arc graph of a symmetric graph is not symmetric, we show that the chromatic number of the iterated arc graph $\delta^k(G)$ still only depends on the chromatic number of G when G is symmetric. arXiv:1610.01259 [math.CO] (Received February 25, 2017)