Generalized Pancake Graphs

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The generalized symmetric group is the wreath product $S_n \wr C_m$, where S_n is the symmetric group of $n!$ elements and C_m is the cyclic group of m elements. In this talk, we consider the Cayley graph of $S_n \wr C_m$ when generated by prefix-reversal generators. We call these Cayley graphs *generalized pancake graphs*. When the cyclic group has one or two elements, respectively, the graphs become the classical *pancake graph* and *burnt pancake graph*. One of our questions of interest is the lengths of the cycles that can be embedded in these generalized pancake graphs. We prove that when the cyclic group has three elements, the underlying graph of the generalized pancake graph is pancyclic, thus resembling a similar property of the pancake graph and the burnt pancake graph.

Keywords: Pancake graphs, prefix-reversal generators, pancyclic