Leslie Hogben* (hogben@iastate.edu), Jephian C.-H. Lin and Michael Young. Multi-part Nordhaus-Gaddum type problems for tree-width, Colin de Verdière type parameters, and Hadwiger number.

A traditional Nordhaus-Gaddum problem for a graph parameter $\beta$ is to find a (tight) upper or lower bound on the sum or product of $\beta(G)$ and $\beta(G)$ (where $\overline{G}$ denotes the complement of $G$). An $r$-decomposition $G_1, \ldots, G_r$ of the complete graph $K_n$ is a partition of the edges of $K_n$ among $r$ spanning subgraphs $G_1, \ldots, G_r$. A traditional Nordhaus-Gaddum problem can be viewed as the special case for $r = 2$ of a more general $r$-part sum or product Nordhaus-Gaddum type problem. We establish results for the $r$-part sum and product Nordhaus-Gaddum type problems for the parameters tree-width and its variants largeur d’arborescence, path-width, and proper path-width; the Colin de Verdière number $\mu$ that is used to characterize planarity, and its variants $\nu$ and $\xi$; and the Hadwiger number. (Received August 05, 2016)