Steven W. Sivek* (ssivek@mit.edu), 282 Massachusetts Ave. #414, Cambridge, MA 02139.

Some plethysm results related to Foulkes’s conjecture.

We provide several classes of examples to show that Stanley’s plethysm conjecture and a reformulation by Pylyavskyy, both concerning the ranks of certain matrices $K_{\lambda}$ associated with Young diagrams $\lambda$, are in general false. We also provide bounds on the rank of $K_{\lambda}$ by which it may be possible to show that the approach of Black and List to Foulkes’s conjecture does not work in general. Finally, since Black and List’s work concerns $K_{\lambda}$ for rectangular shapes $\lambda$, we suggest a constructive way to prove that $K_{\lambda}$ does not have full rank when $\lambda$ is a large rectangle. (Received September 26, 2005)