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**Victor Falgas-Ravry, Kelly O’Connell, Johanna Strömberg and Andrew Uzzell\***,  
andrew.uzzell@unl.edu. *Multicolor hypergraph containers and multicolor graph limits*. Preliminary report.

Alekseev and, independently, Bollobás and Thomason determined the asymptotic size of any hereditary class of graphs  $\mathcal{P}$ . Hatami, Janson, and Szegedy later gave a new proof of this result using graph limits. They also showed that the asymptotic size of  $\mathcal{P}$  is determined by the maximum entropy of a graph limit that may arise from  $\mathcal{P}$ . Saxton and Thomason later used hypergraph containers to prove a special case of the result.

We study both limits and containers for graphs whose edges are labeled with one of  $k$  colors. In particular, we give two proofs of the existence of small container families for hereditary classes of  $k$ -colored graphs. Our work provides a very general method of transferring between hypergraph containers and graph limits in the context of counting graphs in a hereditary class.

Our first proof uses existing hypergraph container results and supersaturation. We then use our container result to generalize the entropy results of Hatami et al. to limits of sequences of multicolored graphs. Our second proof directly extends the entropy results of Hatami et al. to the multicolored setting and then uses these results to construct container families for hereditary classes of  $k$ -colored graphs. (Received February 23, 2016)