1023-05-962 **Anna Draganova*** (adragano@math.ucla.edu), **Yukiyasu Mutoh** and **Richard M. Wilson**.

The directed case of decompositions of edge-colored complete digraphs.

This paper completes the most general setting of an asymptotic existence question of decompositions of complete graphs, the study of which has been a subject of series of papers since the 1970s. Denote by $K_n^{(\lambda_1,\lambda_2,\ldots,\lambda_r)}$ the complete directed graph on r colors and n vertices with λ_i directed edges of color i between any ordered pair of vertices. For any given family of digraphs $\mathcal{G}$, we find necessary and asymptotically sufficient conditions on n for the existence of decompositions of $K_n^{(\lambda_1,\lambda_2,\ldots,\lambda_r)}$ into subgraphs isomorphic to digraphs in $\mathcal{G}$. Our main result provides a convenient set-up for numerous problems in combinatorial design theory; we use it to give a short proof for the asymptotic existence of resolvable (v, k, λ)-BIBDs for any value of λ. This is joint work with Y. Mutoh and R. M. Wilson. (Received September 23, 2006)