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Minor-Closed Classes of Polymatroids

A polymatroid is a function $\rho : 2^E \to \mathbb{Z}$ that has all of the properties of a matroid rank function except that $\rho(X)$ may exceed $|X|$. Some polymatroids can be obtained by adding the rank functions of several matroids on E. We consider minor-closed classes of polymatroids that are obtained by imposing various conditions on the matroids whose rank functions are added. In some cases, we obtain excluded-minor characterizations of these classes; in others we give infinitely many excluded minors, thereby suggesting that excluded-minor characterizations are likely to be very difficult to obtain. This is joint work with Carolyn Chun and Deborah Chun.