Young Tableau Reconstruction Via Minors

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The tableau reconstruction problem, posed by Monks (2009), asks the following. Starting with a standard Young tableau T, a 1-minor of T is a tableau obtained by first deleting any cell of T, and then performing jeu de taquin slides to fill the resulting gap. This can be iterated to arrive at the set of k-minors of T. The problem is this: given k, what are the values of n such that every tableau of size n can be reconstructed from its set of k-minors? For $k = 1$, the problem was recently solved by Cain and Lehtonen. In this paper, we solve the problem for $k = 2$, proving the sharp lower bound $n \geq 8$. In the case of multisets of k-minors, we also give a lower bound for arbitrary k, as a first step toward a sharp bound in the general multiset case.

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