Holshouser, Arthur; **Reiter, Harold**
Two pile move-size dynamic Nim. (English) Zbl 1095.91005
Discrete Math. Theor. Comput. Sci. 7, No. 1, 1-10 (2005).

Summary: The purpose of this paper is to solve a special class of combinational games consisting of two-pile counter pickup games for which the maximum number of counters that can be removed on each successive move changes during the play of the games. Two players alternate moving. Each player in his turn first chooses one of the piles, and his choice of piles can change from move to move. He then removes counters from this chosen pile. A function $f:\mathbb{Z}^+\to\mathbb{Z}^+$ is given which determines the maximum size of the next move in terms of the current move size. The game ends as soon as one of the two piles is empty, and the winner is the last player to move in the game. The games for which $f(k)=k$, $f(k)=2k$, and $f(k)=3k$ use the same formula for computing the smallest winning move size. Here we find all the functions f for which this formula works, and we also give the winning strategy for each function. See the authors and *James Rudzinski*, Dynamic one-pile Nim [Fibonacci Q. 41, No. 3, 253–262 (2003; Zbl 1093.91013)] for a discussion of the single pile game.

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