1103-05-181 **Michael Schweitzer** and **Derek Smith*** (smithder@lafayette.edu). *Solving a Duplication Problem on a Square Grid.* Preliminary report.

The following duplication problem was introduced by Rosenfeld in *The American Mathematical Monthly* in 1991, motivated by efforts to find better bounds for the Shannon capacity of odd cycles. Mark as many cells as possible in an $n \times m$ rectangular grid using the following steps. For the initial step, mark a single cell. For all subsequent steps, find a completely unmarked translate of the currently marked cells, and then mark those cells as well. At the end of k steps, 2^k cells will be marked.

Recently, a specific instance of the problem was posed by Rosenfeld as unsolved: Is it possible to mark 128 cells of a 12×12 square grid? We solve this instance and present proofs, some by hand and some by computer, that determine the largest number of cells that can be marked in an $n \times n$ grid for $n \leq 182$. (Received August 19, 2014)