1116-05-1895 **William P. Noland*** (`wpnoland@noctrl.edu`), 2949 Carlsbad Circle, Aurora, IL 60503, and **Ethan Gegner** and **Robert Winslow**. *Covering Sets for Rectangles in the Lattice.*

The famous Turán-type problems study the maximum fraction of a structure one may select without selecting certain forbidden configurations. Stated in terms of complements, our problem is: given a set S of rectangles of specified dimensions, we want to determine the minimum density of a set A of points in $\mathbb{Z} \times \mathbb{Z}$ such that every copy in $\mathbb{Z} \times \mathbb{Z}$ of any rectangle in S has at least one of its four vertices in A; in this case we say that A is a covering set for the rectangles in S. It is trivial that covering all axb rectangles requires precisely 1/4 of the lattice. Our first result is that the covering density for 1x1 and angled $\sqrt{2}$x$\sqrt{2}$ squares is also 1/4. The primary focus of our work was on covering two different sizes of axis-aligned rectangles. Covering both axb and bxa rectangles requires just 1/4 of the lattice (no more than just axb), though the patterns which do so vary with the relative parity of the dimensions. We also have results on covering pairs of squares, which lead to a general conjecture in that regard. Finally, we have determined the exact required covering density required for axc and axd rectangles. (Received September 21, 2015)