1035-51-1121 **R. Daniel Mauldin*** (`mauldin@unt.edu`), Department of Mathematics, University of North Texas, Box 311430, Denton, TX 76205. *The Steinhaus tiling problem for lattices in R^n.*

Let L be a lattice in $R^d, d \geq 2$. We discuss the following problems: (1) Is there a set S which meets each isometric copy of L in exactly one point? (2) Can such a set be Lebesgue measurable? The set S can be regarded as a simultaneous tiling of R^d. The answer to (1) is yes in case $L = Z^2$ and no in the case of Z^4. The answer to (2) is no for $Z^d, d > 2$ and is unknown for $d = 2$. There are a number of other lattices where the answer is known, but for most lattices the problems remain unsolved. (Received September 18, 2007)