

1103-42-143

Chun Kit Lai* (cklaimath@gmail.com), san francisco, CA 94132, and **Jean-Pierre Gabardo**
and **Yang Wang**. *Gabor orthonormal bases generated by the unit cubes.*

We consider the problem in determining the countable set Λ in the time-frequency space so that the Gabor system, $\mathcal{G}(\chi_{[0,1]^d}, \Lambda)$, generated by the characteristic function of the unit cube on \mathbb{R}^d form a Gabor orthonormal basis (GONB). We show that all such Λ must be a tiling set of the 2d dimensional unit cube. Moreover, all admissible Λ on $d = 1, 2$ are classified. An interesting and surprising result is that for $d \geq 2$, apart from the standard structure of Λ , there exists Λ so that $\mathcal{G}(\chi_{[0,1]^d}, \Lambda)$ forms a GONB but the unit cube in the time side has a significant amount of overlaps when translated by the time component of Λ . (Received August 18, 2014)