1138-42-312 **Azita Mayeli*** (amayeli@gc.cuny.edu), New York, NY 10016. *Non-separable lattices, Gabor orthonormal bases and Tilings.* Preliminary report.

Let K be a subset of $\mathbb{R}^d$ with positive and finite Lebesgue measure. Let $\Lambda = M(\mathbb{Z}^{2d})$ be a lattice in $\mathbb{R}^{2d}$ with density $\text{dens}(\Lambda) = 1$. It is well-known that if M is a diagonal block matrix with diagonal matrices A and B, then the Gabor system $\mathcal{G}(|K|^{-1/2}\chi_K, \Lambda)$ is an orthonormal basis for $L^2(\mathbb{R}^d)$ if and only if K tiles both by $A(\mathbb{Z}^d)$ and $B^{-t}(\mathbb{Z}^d)$. However, there has not been any intensive study when M is not a diagonal matrix. We investigate this problem for a large class of important cases of M. We also provide a constructive way for forming a Gabor window functions for a given upper triangular lattice. Our study is related to a Fuglede's type problem in Gabor setting and we give a partial answer to this problem in the case of lattices. This is a joint work with C. Lai. (Received February 12, 2018)