1120-41-70   **Laura De Carli***, Dept. mathematics, Univ. Park, Miami, FL 33199. *Exponential bases on rectangles in R^d.* Preliminary report.

Let Q be the union of N unit cubes in $\mathbb{R}^d$ with vertices in $\mathbb{Z}^d$. We show necessary and sufficient conditions that ensure that a set of exponential $\mathcal{B} = \{e^{2\pi i(\vec{n}+\vec{d}_j)x}\}_{n\in\mathbb{Z}^d, 1\leq j\leq N}$ is an exponential basis on Q. In the process, we also show that $\mathcal{B}$ is a Riesz basis if and only if it is a frame and if and only if it is a Riesz sequence. We also prove a new stability theorem for $\mathcal{B}$. The proof of our main result relies on the semigroup properties and precise norm estimates of a remarkable family of linear operators on $\ell^2(Z^d)$. (Received February 10, 2016)