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Vignon S Oussa* (vignon.oussa@bridgew.edu), Department of Mathematics Conant Science & Ma, Bridgewater, MA 02325. *Parseval Frame Wavelets on Some Non-Abelian Nilpotent Matrix Groups*. Preliminary report.

We present the existence and construction of Shannon-like Parseval frame wavelets on some groups of nilpotent matrices isomorphic to $(\mathbb{R}^{n-2d} \times \mathbb{R}^d) \rtimes \mathbb{R}^d$. Let N be an element of such class of non commutative matrix groups of dimension n . There is a faithful representation of N in $GL(n+1, \mathbb{R})$ and a faithful representation of a discrete group H in $GL(n+1, \mathbb{R})$ such that H is a subgroup of $\text{Aut}(N)$ isomorphic to \mathbb{Z} . Let L be the left regular representation of N acting in $L^2(N)$. We define the representation $D : H \rightarrow U(L^2(N))$, by $D_A f(\cdot) = \det(Ad_A)^{-1/2} f(A^{-1}\cdot)$. Moreover we prove the existence of a lattice subgroup Γ , and we construct a countable family of functions $\{f_k : k \in \mathbb{I}\}$ such that the system $\{D_{A^j} L(\gamma) f_k : \gamma \in \Gamma, j \in \mathbb{Z}, k \in \mathbb{I}\}$ is a Parseval frame in $L^2(N)$. In our talk, we also explore some connections between the analysis of the class of groups presented and Gabor theory. (Received October 16, 2012)