**Semi-linear Cauchy problem associated with a $p$-adic non-local ultra-diffusion operator**

**A joint work by J. Galeano-Peñaloza, O.F. Casas-Sánchez and L.F. Chacón-Cortés.**

**Abstract.** This work is dedicated to study the pseudodifferential operator $(D^{\alpha}_{d_1,d_2}\varphi)(x) = -\int\limits_{\mathbb{Q}_p^n} \mathcal{A}^{-\alpha}_{d_1,d_2}(y)[\varphi(x+y)-\varphi(x)]d^n y$, which can be seen as a generalization of Taibleson operator; here $\mathcal{A}^{\alpha}_{d_1,d_2}(x) = \max\left\{\|x\|_p^{d_1},\ \|x\|_p^{d_2}\right\}^{\alpha}$. We show that semi-linear Cauchy problem is well-posed in $\mathfrak{M}_{\lambda}$ (a Banach space containing functions that do not belong to $L^1(\mathbb{Q}_p^n)$), assuming that semi-linear part $f$ is a Lipschitz function. We associate to the corresponding homogeneous problem a Markov process, which is indeed a Feller process.