1065-14-122 **Yifeng Liu*** (liuyf@math.columbia.edu), Room 509, MC4406, Department of Mathematics, Columbia University, 2990 Broadway, New York, NY 10027. *A non-archimedean Calabi-Yau theorem for totally degenerate abelian varieties.*

The theorem of Calabi-Yau is one of the most important results in complex geometry. In this work, we consider the similar question for a non-archimedean field in a special case. Let A be a totally degenerate abelian variety over $\mathbb{C}_p$ of dimension d, i.e., $A^{\mathrm{an}} \cong \left(\mathbb{G}_m^d\right)^{\mathrm{an}}/M$ for a complete lattice $M \subset \mathbb{G}_m^d(\mathbb{C}_p)$. We have an evaluation map $\tau_A : A^{\mathrm{an}} = \left(\mathbb{G}_m^d\right)^{\mathrm{an}}/M \to \mathbb{R}^d/\Lambda$ with a complete lattice $\Lambda \subset \mathbb{R}^d$, which is continuous and surjective. It has a continuous section $i_A : \mathbb{R}^d\Lambda \hookrightarrow A^{\mathrm{an}}$. Then we prove the following theorem which is a certain non-archimedean analogue of the classical Calabi-Yau theorem.

Let A and L be as above. For any measure $\mu = f\mathrm{d}\mathbf{x}$ of $\mathbb{R}^d/\Lambda$ with f a positive smooth function and $\int_{\mathbb{R}^d/\Lambda}\mu = \deg_L(A)$, there is a semi-positive metric $\| \ \|$ on L in the sense of Zhang, unique up to a constant multiple, such that $c_1(\overline{L})^d = (i_A)_*\mu$, where $\mathrm{d}\mathbf{x}$ is the Lebesgue measure on R^d/Λ and $\overline{L} = (L, \| \ \|)$. (Received September 08, 2010)