1110-35-330 **Jungang Li*** (`fl6532@wayne.edu`), Wayne State University, 656 W. Kirby, Detriot, MI 48202.
Sharp Moser-Trudinger Inequality on Complete Noncompact Riemannian Manifolds

We will consider the sharp Li-Ruf type critical Moser-Trudinger inequality on complete noncompact Riemannian manifolds. Namely,

$$\sup_{u\in W^{1,n}(M),||u||_{1,\tau}\leq 1}\int_M \phi(\alpha_n|u|^{\frac{n}{n-1}})dV_g \leq C(n,\tau) \tag{1}$$

Where $\phi(t)=\sum_{k=n-1}^{\infty}\frac{t^k}{k!}$, α_n is the Moser's constant, $||u||_{1,\tau}=(\int_M \tau|u|^n+|\nabla u|^n)^{\frac{1}{n}}$. The inequality is sharp. Our method is motivated by an earlier symmetrization-free argument due to Lam and Lu in the Heisenberg group (Adv. Math. (2012)) or high order Sobolev spaces (J. Diff. Equ. (2013)) where they develop a general method to derive global Moser-Trudinger inequalities on domains of infinite measure from local ones on domains of finite measure. This method works in more general settings.

Moreover, we prove the Adachi-Tanaka's version of sharp subcritical Moser-Trudinger inequality on complete noncompact Riemannian manifolds. Namely,

$$\frac{1}{||u||_n^n}\int_M \phi(\alpha|u|^{\frac{n}{n-1}})dV_g \leq C \tag{2}$$

holds for all $u\in W^{1,n}(M)$ such that $||\nabla u||_n\leq 1$, $\alpha<\alpha_n$. This is a joint work with Prof. Guozhen Lu. (Received February 24, 2015)