Harnack inequality and the relevant theorems on Finsler metric measure manifolds

Yalu Feng[1]
joint work with Cheng Xinyue[1]

[1] Chongqing Normal University, Chongqing, P. R. China

In this talk, we carry out in-depth research centering around the Harnack inequality for positive solutions to nonlinear heat equation on Finsler metric measure manifolds with weighted Ricci curvature Ric_∞ bounded below. Aim on this topic, we first give a volume comparison theorem of Bishop-Gromov type. Then we prove a weighted Poincare inequality by using Whitney-type coverings technique and give a local uniform Sobolev inequality. Further, we obtain two mean value inequalities for positive subsolutions and supersolutions of a class of parabolic differential equations. From the mean value inequality, we also derive a new local gradient estimate for positive solutions to heat equation. Finally, as the application of the mean value inequalities and weighted Poincare inequality, we get the desired Harnack inequality for positive solutions to heat equation.