

1077-35-74

**Sharad Deep Silwal\*** (sharad@math.ksu.edu), **Diego Maldonado** (dmaldona@math.ksu.edu) and **Sapto Indratno** (saptotea@yahoo.com). *The critical density property and Harnack's inequality in spaces of homogeneous type*. Preliminary report.

In their pioneering work in the context of non-divergence form PDEs in 1981, Krylov and Safonov introduced a new probabilistic approach to Harnack's inequality. The so-called critical density property was the central idea in their technique. We describe a new axiomatic approach to Harnack's inequality in spaces of homogeneous type based on the critical density property and the doubling property as a weight. Our approach avoids the use of BMO and covering lemmas and sheds some new light onto the role of the critical density property. This is joint work with Diego Maldonado and Sapto Indratno. (Received September 20, 2011)