Krylov-Safonov Harnack inequality for a class of linear parapolic equations with singular degenerate coefficients

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We discuss a class of linear parabolic equations in non-divergence form in which the leading coefficients are measurable and they can be singular or degenerate as a weight belonging a class of Muckenhoupt weights. Krylov-Safonov Harnack inequalities for non-negative solutions are established under some smallness assumption on a weighted mean oscillation of the weight. To prove the result, we introduce a class of generic weighted parabolic cylinders through which several growth lemmas are established. As corollaries, Holder regularity estimates of solutions with respect to a quasi-distance are proved. If time permits, several other recent related results on Sobolev regularity estimates will be discussed. The material of the talk is based on the joint work with Professor Sungwon Cho (Gwangju National University of Education, South Korea) and my Ph.D. student Junyuan Fang (UTK).

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