

# **’Harnack inequalities for symmetric non-local Dirichlet form and their stability’**

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Abstract: In this talk, we will discuss parabolic and elliptic Harnack inequalities for symmetric non-local Dirichlet forms on metric measure spaces under general volume doubling condition. We will present stable equivalent characterizations of parabolic Harnack inequalities in terms of the jumping kernels, variants of cutoff Sobolev inequalities, and Poincaré inequalities. In particular, we establish the connection between parabolic Harnack inequalities, elliptic Harnack inequalities, and two-sided heat kernel estimates, as well as with the Hölder regularity of parabolic functions for symmetric non-local Dirichlet forms. Stability of elliptic Harnack inequalities will also be discussed, if time permits. Based on joint work with Takashi Kumagai and Jian Wang.