

# Hess-Schrader-Uhlenbrock inequality for the heat semigroup on differential forms over Dirichlet spaces tamed by distributional curvature lower bounds

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The notion of tamed Dirichlet space was proposed by Erbar, Rigoni, Sturm and Tamanini ('22) as a Dirichlet space having a weak form of Bakry-Émery curvature lower bounds in distribution sense. After their work, Braun ('21+) established a vector calculus for it, in particular, the space of  $L^2$ -normed  $L^\infty$ -module describing vector fields, 1-forms, Hessian in  $L^2$ -sense. In this framework, we establish the Hess-Schrader-Uhlenbrock inequality for 1-forms as an element of  $L^2$ -cotangent bundles, (an  $L^2$ -normed  $L^\infty$ -module), which extends the result on the Hess-Schrader-Uhlenbrock inequality under an additional condition by Braun ('21+).