A PDE-based approach to Borell-Brascamp-Lieb inequality

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Abstract

In this talk, we provide a new PDE perspective for the celebrated Borell-Brascamp-Lieb inequality. In contrast to previously known proofs involving techniques from convex analysis or optimal transport, our new proof is based on properties of diffusion equations of porous medium type, including a generalized concavity maximum principle and large time asymptotics. Our approach reveals a deep connection between the Borell-Brascamp-Lieb inequality and nonlinear parabolic equations. We also recover the equality condition in the special case of the Prékopa-Leindler inequality by further exploiting additional properties of the heat equation. This talk is based on recent joint work with Kazuhiro Ishige and Paolo Salani.