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Null-Controllability of the Heat and Kolmogorov Equations

Abstract. In this talk, we will focus on the null-controllability properties of two dissipative equations. We will start by presenting the parabolic case of the fractional heat equation posed on the whole space $\mathbb{R}^n$ (focusing mainly on the high-dissipation regime), whose null-controllability properties are linked to the geometric notion of thickness. We will then turn our attention to the hypoelliptic model of the Kolmogorov equation, also posed on the whole space $\mathbb{R}^{2n}$. We will see that the fact that this equation is non-selfadjoint induces new phenomena compared to the parabolic case (new geometries for the control supports and existence of minimal times). These results come from a series of works with J. Martin (LJLL).