



MAFIA - the seminar you can't refuse

Elliptic operators with unbounded coefficients

Sallah Eddine BOUTIAH

Ferhat Abbas University

March 19, 2024

12:00–13:00

in T212

Fakulta jaderná a fyzikálně inženýrská ČVUT
Trojanova 13, 12000 Praha

Abstract: In recent years there have been substantial developments in the theory of second order elliptic operators with unbounded coefficients, see for example [1], [2], [3] and the references therein.

In this talk I will discuss various recent results related to the following second-order elliptic operator

$$\mathcal{A} = q(x)\Delta + F(x) \cdot \nabla_x - V(x)$$

defined in the whole \mathbb{R}^N . This kind of operators arise as a model in many field of science, especially in stochastic analysis (Ornstein-Uhlenbeck operators), mathematical finance (Black-Scholes equation and Cox-Ingersoll-Ross model), in physics (in non-relativistic quantum mechanics the Schrödinger operator). In particular, we are interested in studying quantitative and qualitative properties in $L^p(\mathbb{R}^N)$, $1 < p < \infty$, of the elliptic operator \mathcal{A} where $q(x) = (1 + |x|^\alpha)$, and $F(x) = b|x|^{\alpha-2}x$.

REFERENCES

- [1] S.E. Boutiah, F. Gregorio, A. Rhandi and C. Tacelli, Elliptic operators with unbounded diffusion, drift and potential terms, *Journal of Differential Equations*, **264** (2018), 2184–2204.
- [2] S. E. Boutiah, A. Rhandi and C. Tacelli, Kernel estimates for elliptic operators with unbounded diffusion, drift and potential terms. *Discrete and Continuous Dynamical Systems*, 39(2): 2019, 803-817.
- [3] S. E. Boutiah, L. Caso F. Gregorio, C. Tacelli, Some results on second-order elliptic operators with polynomially growing coefficients in L^p -spaces, *Journal of Mathematical Analysis and Applications*, 501(2), 125209, 2021.