THE HONG KONG POLYTECHNIC UNIVERSITY
香港理工大學

DEPARTMENT OF APPLIED MATHEMATICS
應 用 數 學 系

PolyU-PDE Seminar

Professor Xu Chao-Jiang

Nanjing University of Aeronautics and Astronautics, China

Topic

Analytic smoothing effect of a class of ultra-parabolic equations

Date| Time

24 March 2025 (Monday) | 16:00 – 17:00 (HK Time)

Venue

Y303

Abstract:

We study a class of ultra-parabolic equations, it is a high order degenerate parabolic operators of Hormander type, so it is strongly degenerate, but we prove that this class operators possesses the analytic smoothing effect of Cauchy problem, that means, for the initial datum belongs to L^2, we prove that the solution is analytic for all spatial variables when $t>0$. This class operators contains many kinetic operators such as, Kolmogorov-Fokker-Planck operators, Landau operators and non-cutoff Boltzmann operators. To overcome the degeneracy in the spatial variable, a family of well-chosen vector fields with time-dependent coefficients will play a crucial role, and the analytic regularization effect of weak solutions relies on a quantitative estimate on directional derivatives in these vector fields.

ALL ARE WELCOME