

Abstract

In this talk, we will introduce some new notions, especially the eventual continuity of Feller semigroups and give the sharp criterions or equivalent characterizations about the ergodicity and asymptotic stability for Feller semigroups on Polish spaces with full generality. Furthermore, we will revisit the unique ergodicity and prove the asymptotic stability of stochastic 2D Navier-Stokes equations with degenerate stochastic forcing according to our criteria. We will also extend the fundamental gap comparison theorem of Andrews and Clutterbuck to the infinite dimensional setting.