

Reflected diffusions in generalised parabolic domains

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Abstract

This talk will describe the long-time behaviour of **driftless** reflected diffusions in unbounded domains of generalised parabolic type. Asymptotically normal reflection leads to the reflected diffusion exhibiting phenomena from transience to polynomial ergodicity.

If the reflection is asymptotically oblique, there is a natural dichotomy according to whether it is pointing (\rightarrow) "away from" or (\leftarrow) "towards" the origin. In the case (\rightarrow), we characterise explosion and almost sure superdiffusivity of the process, including a second-order CLT-type result in the superdiffusive case. In the case (\leftarrow), we characterise phenomena ranging from sub-exponential to uniform ergodicity. In the uniformly ergodic case, the reflected process can be started from infinity (with an infinite amount of local time at time zero). All of the criteria for these stochastic phenomena are in terms of the asymptotic behaviour at infinity of the model parameters.

This is joint work with Miha Bresar, Juan Pablo Chavez Ochoa, Mikhail Menshikov, Isao Sauzedde and Andrew Wade.

*Punctual, i.e. sine tempore!