Sayan Banerjee* (sayan@email.unc.edu), NC, and Debankur Mukherjee. Joining the shortest queue and non-elliptic reflected diffusions.

Consider a system of N parallel single-server queues with unit-exponential service time distribution and a single dispatcher where tasks arrive as a Poisson process of rate l(N). When a task arrives, the dispatcher assigns it to one of the servers according to the Join-the-Shortest Queue (JSQ) policy. Eschenfeldt and Gamarnik (2015) established that appropriately scaled functionals of the queueing network under the JSQ policy converge weakly to associated functionals for a certain non-elliptic reflected diffusion process as N grows. I will talk about analyzing the detailed behavior of the steady state of this non-standard diffusion process using tools from renewal theory. The tails and bulk behavior of the steady state distribution and sample path fluctuations of the diffusion process will be explored. We will also see how the steady state shows a stark difference in behavior between two regimes governed by a system parameter. This is joint work with Debankur Mukherjee. (Received February 04, 2019)