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A Brownian control problem for a simple queueing system in the Halfin-Whitt regime

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ABSTRACT

We consider a formal diffusion limit for a control problem of a multi-type multi-server queueing system, in the regime proposed by Halfin and Whitt, in the form of a control problem where the dynamics are driven by a Brownian motion. In one dimension, a pathwise minimum is obtained and is characterized as the solution to a stochastic differential equation. The pathwise solution to a special two-dimensional problem (corresponding to a two-type system) follows.