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A Notion of Equivalence between Linear and Nonlinear Stochastic PDE's

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We examine stochastic partial differential equations in which the solutions are stochastic processes that take values in a separable Hilbert space like a function space. These solutions admit a natural transition probability measure on the space. We show that in some cases, the stochastic process that results from a nonlinear stochastic PDE induces a probability measure that is "equivalent" to the measure induced by the stochastic process resulting from a linear stochastic PDE. We introduce a concept of equivalence for these measures that is analogous to the notion equivalence of measure in real and finite spaces. This equivalence result may allow us to analyze other dynamic properties of certain nonlinear stochastic partial differential equations.

Biography

Andrea Watkins Hairston was born and raised in Detroit, MI. She attended Howard University in Washington, D.C., where she was a member of the Howard University Women's Softball team. As a student-athlete, Andrea earned a B.S. in Mathematics with a minor in Philosophy. With the support of a National Physical Sciences Consortium Graduate Fellowship, she matriculated to Duke University, where she obtained her M.A. and Ph.D degrees in Mathematics. Andrea's research interests are in the areas of stochastic partial differential equations, probability, and analysis of limiting behaviors for queueing systems. She has spent time studying the qualitative behaviors of certain stochastic dynamical systems both as a part of her own research program and as a graduate fellow at the Statistical and Mathematical Sciences institute.