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Radu Dascaliuc* (dascalir@math.oregonstate.edu), OSU Department of Mathematics,
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Some evolution equations can be naturally associated with stochastic processes that can be used to generate solutions. An example being heat equation and Brownian motion. In the nonlinear case the stochastic processes take form of a branching random walk. We show how stochastic explosion in these branching processes can be exploited to prove the lack of uniqueness for the associated PDE. We illustrate this approach on the alpha-Riccati equation, which can be viewed as an allegory to the Navier-Stokes system, and discuss possible implications to the the existence and uniqueness problem for the full 3D incompressible Navier-Stokes equations.

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