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PARAMETER IDENTIFICATION FOR STOCHASTIC BURGERS' FLOWS VIA PARABOLIC RESCALING

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Abstract: The paper presents a systematic study of classical statistical inference problems (parameter estimation and hypothesis testing) for random fields arising as solutions of the one-dimensional nonlinear diffusion equation with random initial data (the Burgers' turbulence problem). This nonlinear, hydrodynamic-type partial differential equation is an ubiquitous model in physics and engineering. This work can be seen as part of a larger program of developing statistical inference tools for complex stochastic flows governed by nontnvial, physically constrained dynamics.

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Key words and phrases: Burgers' equation, random data, parabolic scaling, singular spectrum, discretization, Jacobi theta-function, parameter estimation, space domain, frequency domain, periodogram.

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