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Applications of Statistical Process Monitoring of Mean-Reverting Diffusion Processes in Flight Test

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Dr. Shokoufeh Mirzaei, Erich Brownlow, Dr. James Brownlow, Dr. Robert Poulson

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California State Polytechnic University, Pomona
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14. ABSTRACT

The purpose of this paper is to introduce the application of statistical process monitoring methods for mean-reverting diffusion processes. To develop the statistical process monitoring of a mean-reverting diffusion process, at first, it is assumed that the process is the sum of squares of standard Ornstein-Uhlenbeck (OU) processes. Using this assumption, the resulting process is characterized and its capability metrics are calculated. Then, the assumption is relaxed, and a generalized control charting method is provided for any diffusion process when the generalized method of moments is used for the estimation of the process parameters.

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