# Moment Evolution equations for stochastic dynamic systems with non-Markovian response

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# Synopsis

Structures are generally subjected to random time varying loads such as earthquakes, wind and waves. The random nature of these loads can be incorporated by modeling the loads as stochastic processes. Dynamic systems under such loading are known as stochastic dynamic system. Due to the stochastic nature of the loads it is evident that the response will be also stochastic in nature. Knowledge of the statistics of the response is crucial for computation of first passage failure probability and out-crossing rates of structures. Till date most of the existing methods used in these classes of problems has assumed that the response is a Markov process. This has helped in solving problems due to the availability of vast literature on Markov theory. However, real life structures exhibit non-Markovian nature of response due to loading and internal properties. Damping is one of the properties that affect the assumed Markov property of the response. The objective of the current study is to develop moment evolution equations of response of a structure which is non-Markovian due to the damping of the structure.