



INTISARI

KAJIAN MEKANIKA GEOMETRIK STOKASTIK DAN TERAPANNYA PADA SISTEM-SISTEM MEKANIS

Oleh

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Telah dilakukan pengkajian mekanika geometrik stokastik sebagai sebuah perumuman dari mekanika stokastik dan mekanika geometrik. Ruang fase sistem mekanis klasik diwakili oleh suatu keragaman simplektik atau Poisson dan dinamikanya di bawah pengaruh gangguan acak dituliskan dengan ungkapan persamaan diferensial stokastik. Terapan riil ditunjukkan melalui tinjauan pada dua macam sistem berupa turbin dan seismograf. Sebagai hasil, dinamika keduanya berturut-turut dapat dinyatakan dengan persamaan diferensial stokastik Stratonovich pada keragaman $(S^1 \times \mathbb{R}, \omega)$ dan (\mathbb{R}^2, ω_0) .

Kata-kata kunci : sistem mekanis klasik, keragaman simplektik, keragaman Poisson, persamaan diferensial stokastik.



ABSTRACT

THE STUDY OF STOCHASTIC GEOMETRIC MECHANICS AND ITS APPLICATION TO MECHANICAL SYSTEMS

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A generalization of stochastic mechanics and geometric mechanics which is called stochastic geometric mechanics has been studied. Phase spaces of classical mechanical systems are represented by symplectic or Poisson manifolds and the dynamics of the systems under stochastic perturbations are written in the expressions of stochastic differential equation. Two kinds of systems taken as concrete cases are turbines and seismographs. As results, the dynamics of both of them respectively can be expressed with Stratonovich differential equations in $(S^1 \times \mathbb{R}, \omega)$ and (\mathbb{R}^2, ω_0) .

Keywords : classical mechanical system, symplectic manifold, Poisson manifold, stochastic differential equation.