

INTISARI

KAJIAN DINAMIKA PENDULUM GANDA PADA RUANG KONFIGURASI $S^1 \times S^1$ DENGAN PERSAMAAN POINCARÉ DAN METODE RAYLEIGH-RITZ

Oleh

WAHYU DANI SWARI

12/340137/PPA/04051

Telah dikaji secara mekanika geometrik dinamika pendulum ganda pada ruang konfigurasi $S^1 \times S^1$. Kajian aspek geometris menghasilkan persamaan geodesik pada energi mekanik tertentu, sedangkan tinjauan aspek simetris melalui persamaan Poincaré menghasilkan persamaan gerak dalam ungkapan kecepatan kuasi dan koordinat kuasi. Penerapan metode langsung Rayleigh-Ritz pada fungsional persamaan gerak menghasilkan selesaian bagi persamaan gerak sistem pendulum ganda.

Kata-kata kunci : mekanika geometrik, persamaan Poincaré, metode langsung Rayleigh-Ritz, dan pendulum ganda.

ABSTRACT

A STUDY OF DOUBLE PENDULUM DYNAMICS ON $S^1 \times S^1$ CONFIGURATION SPACE WITH POINCARÉ EQUATION AND RAYLEIGH-RITZ METHOD

By

WAHYU DANI SWARI

12/340137/PPA/04051

Geometric mechanics of double pendulum on $S^1 \times S^1$ configuration space has been studied. The study of geometrical aspects of the system yield the geodesic equation on a particular mechanical energy, while the consideration of symmetrical aspects yield the equation of motion through Poincaré equation on quasi velocity and quasi coordinate description. The application of Rayleigh-Ritz direct method on equation of motion functional yields the solution of equation motion for double pendulum system.

Keywords : geometric mechanics, Poincaré equation, Rayleigh-Ritz direct method, and double pendulum.