



INTISARI

TENTANG GEOMETRISASI DAN PENGKUANTUMAN GEOMETRIK PADA TEORI MEDAN RELATIVISTIK

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Kajian tentang geometrisasi teori medan relativistik dan pengkuantuman geometrik padanya telah dilakukan. Kajian ini didasarkan atas kajian keragaman simplektik dan sistem dinamik berdimensi tak berhingga khususnya pada aspek-aspek yang membedakannya dari yang berhingga. Perbedaan tersebut di antaranya adalah adanya sifat tak-merosot kuat dan lemah, ketakberlakuan teorema Darboux serta masalah diferensiabilitas aliran. Geometrisasi diperoleh dengan memandang ruang solusi sistem medan sebagai keragaman simplektik berdimensi tak berhingga, struktur simplektik dikonstruksi dari rapat Lagrangian sistem. Dibahas pula geometrisasi sistem medan berinteraksi, khususnya interaksi medan tera dan medan relativistik. Selanjutnya metode pengkuantuman geometrik diterapkan pada keragaman simplektik hasil geometrisasi ini sehingga menghasilkan gambaran medan kuantum.

Kata-kata kunci : geometrisasi, keragaman simplektik, ruang solusi, pengkuantuman geometrik.



ABSTRACT

ON THE GEOMETRIZATION AND GEOMETRIC QUANTIZATION OF RELATIVISTIC FIELD THEORY

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The geometrization of relativistic field theories and their geometric quantization has been carried out on basis of the study of infinite dimensional symplectic manifold and dynamical system, especially on those aspects that distinguishes it from the finite one. The different aspects are weak non-degenerate and strong non-degenerate concepts, the failure of the Darboux theorem and problems on differentiability of flows. The geometrization is obtained by assuming that the space of solution is an infinite dimensional symplectic manifold in which the symplectic structure is constructed from the Lagrangian density of the system. The geometrization of interacting system is also studied, especially the interaction between gauge field and relativistic field. Furthermore, the geometric quantization method is applied on symplectic manifold which is yielded from the geometrization procedure, so that the quantum field description is obtained.

Keywords : geometrization, symplectic manifold, solution space, geometric quantization.