Annals of the Academy of Romanian Scientists
Series on Science and Technology of Information
ISSN 2066 - 8562 Volume **2**, Number **1**/**2009**

THE CLASSIFICATION OF THE HAMILTONIAN MECHANICAL SYSTEMS USING THE ALMOST SYMPLECTIC CONJUGATION CRITERION

Adrian LUPU[1], Petre STAVRE[2]

Rezumat. *În acest articol vom continua studiul din* [4]*, cu aplicaţii la sistemele mecanice hamiltoniene. Vom obţine un criteriu de comparaţie al acestor modele.*

Abstract. *In this paper we will continue the study from [4] , with applications to the Hamiltonian mechanical systems. We will obtain a comparison criterion of these models.*

Key words: locating system**,** anisotropic source, energetic intensity distribution

1. Introduction.

The almost symplectic and the integrable almost symplectic structures play an important role in the theory of the geometrical models of the Hamiltonian mechanical systems.

Let us consider $M_n = \left(M, [A], R^n\right)$ a real, n-dimensional C^∞ differentiable manifold, which is paracompact, connected and $\xi = \left(E = TM, \pi, M\right)$, the tangent bundle of the M_n manifold and $\xi^* = \left(E^* = T^*M, \overset{*}{\pi}, M\right)$, the cotangent bundle.

In Hamiltonian mechanics, M is called the configuration space, TM is the speed space and T^*M is the phase space.

Generally speaking, a nondegenerate differential 2 form, on a differentiable manifold is an almost symplectic structure. The manifold dimension must be an even number so that the nondegenerate differential 2-form could exist. For ω to be integrable, from the point of view of topology, the manifold must be orientable. We have $\dim TM = 2n$ and $\dim T^*M = 2n$.

An almost symplectic structure defines an isomorphism between TM and T^*M so, for any vectorial field ξ, on M, there is a differential form, α, such that:

$$(1) \qquad \omega\left(\xi, Y\right) = \alpha(Y)$$

[1]Technical High School, Drobeta Turnu Severin, adilupucv@yahoo.fr
[2]University of Craiova.