



BI-HAMILTONIAN STRUCTURES ON THE TANGENT BUNDLE TO A POISSON MANIFOLD

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Abstract. In the case when M is equipped with a bi-Hamiltonian structure (M, π_1, π_2) we show how to construct family of Poisson structures on the tangent bundle TM to a Poisson manifold. Moreover we present how to find Casimir functions for those structures and we discuss some particular examples.

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Contents

1	Introduction	47
2	Lifting of Poisson and Bi-Hamiltonian Structures	48
3	Deformations of Tangent Poisson Structures	52
4	Examples	57
	References	63

1. Introduction

The theories of Poisson and bi-Hamiltonian manifolds are one of important tools of the theory of integrable systems, see [1, 2, 10, 18, 24, 29]. The theory of Lie algebroids is another useful tool (see e.g. [3, 4, 9, 12, 13, 16, 31]) There are links between Poisson manifolds and Lie algebroids. It is well known that the total space of the dual bundle of a Lie algebroid has a canonical Poisson structure and there exists the canonical algebroid bracket of differential forms $A = T^*M$, where