04. Differential Geometry

BRYLINSKI COHOMOLOGY OF POISSON MANIFOLDS AND QUANTUM DE RHAM COHOMOLOGY

Vadim V. Shurygin, jr.

In the present paper, we study the cohomology of the canonical double complexes of Poisson manifolds. This cohomology was introduced by J.-L. Brylinski in [1]. We prove that, for any Poisson manifold (M, w), this cohomology is isomorphic to the de Rham cohomology of M. In the case of a symplectic manifold, this was shown in [1]. As an application of the result obtained, we prove that the quantum de Rham cohomology of a Poisson manifold introduced by H.-D. Cao and J. Zhou in [2] is a deformation quantization of the ordinary de Rham cohomology.

[1] J.-L. Brylinski, *A differential complex for Poisson manifolds*, J. Diff. Geom. **28** (1988), 93–114.

[2] H.-D. Cao, J. Zhou, *On quantum de Rham cohomology*, preprint math.DG/9806157, 1998.

1991 MSC: 53D17, 53D55.

Keywords: Poisson manifolds, deformation quantization, quantum de Rham cohomology.

Chair of Geometry,
Department of Mathematics,
Kazan State University,
Kremlevskaya Str. 18, Kazan,
420008, RUSSIA

E-mail: 1Vadim.Shurygin@ksu.ru