

Singular symplectic forms and round functions

Bogusław Hajduk

April 3, 2007

This is a report on a joint work with V. Sharko and M. Lewkowicz on singular symplectic forms and Morse-Bott 1-forms with round singularities. Singular symplectic forms we consider are differential 2-forms yielding generic representatives of a given cohomology class $a \in H^2(M, \mathbb{R})$ and having minimal singular set. If ω is such a form and it is invariant with respect to an action of the circle, then we get a 1-form $\eta = i_X\omega$, where X is the vector field which generates the action. Now η has the same singularities as ω . In the case of an action without fixed points the singular set is a collection of circles. So we come to a problem what is the minimal number of such circles, or equivalently what is the minimal number of singular circles of a function with values in the circle and round (consisting of circles) singular set. The aim of the present project is to extend existence theorems for singular symplectic representatives given by LeBrun, Honda and others, calculate minimal number of singular circles for some classes of 1-forms as well as to study mutual applications of these two subjects.