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THE SUM OF INDEX ON A SPECIAL POINTS OF A VECTOR FIELD ON COMPACT MULTIPLE-VARIOUS

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ABSTRACT

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In this paper, the sum of the indices of the special points of a vector field in an arbitrary two-dimensional compact polynomial is independent of the field

KEY WORDS: *retraction of deformed, multiple-diversity of compact, a vector field on the multiple-diversity, retraction.*

ANALYSIS

$M-n$ Let be a smooth polynomial of size. If it optional on a point at $p \in M$ T_pM a vector of experimental space $X(p)$ if applicable, in this case the plural X the vector is called given part of space A - M, be an accurate reflection $I_A : A \to A$

Definition. If it a reflection available $r : M \to A$, $r|_A = I_A$ Then this from M to A are called retraction. Part of the space is called A - M retract

Definition. If $r : M \to A$ reflection is available, If $r : M \to A$, then $r|_A$ I_A is called a weak tap of M, and from r - M to A is called a weak tap

Definition. M - deformation of part A of space into space $D : X \times I \to X$ is called homeopathy $D(x,0) = x, D(x,t) \in A$ on the all $x \in X$

Definition.[8] If it from M to A to $D : X \times I \to X$ if has been $D(x,0) = x, D(x,t) \in A$, $t \in I$ deformation, has been deformed retraction of A - M, D is called severely deformed retraction.

Theorem. In arbitrary two-dimensional compact polynomials, the sum of the indices of the special points of the vector field is independent of the field.

Proof. Suppose R^3 and M^2 are given by at polynomials.

M^2 get $U(M^2)$, a sufficiently small circle of the polynomial M in R^3.

This medium is homeomorphic to the circle D^1

The projection TM is a smooth retraction, and the polynomial M^2 is a strongly deformed retraction of the space $U(M^2)$

Intuitively, the circumference of $U(M^2)$ a unified messaging system of a polynomial M^2 can be considered as:

M^2 consists of circles $D_r^1(x)$ lying in orthogonal one-dimensional planes to the planes of the polygon, and $\overline{U(M^2)}$ is a compact polyhedron.

Like $H_2^s(\partial U(M^2);Z) \quad Z$, the constituents of this group are $U(M^2)$, the boundary loop.

Therefore, any reflection $\ddot{} : \partial U(M^2) \to S^2$ identifies the element Z :

We can saw field of $\Phi : \overline{U(M^2)} \to R^3$ not change into zero

On $\deg \ddot{} \in Z \quad \partial U(M^2)$ Let's set up a normal reflection for this field:

$$\Phi : \partial U(M^2) \to S^2, \Phi X = \Phi x / \| \Phi_x \|$$

Φ degree of reflection $\deg \Phi \;\; \Phi$ will be equal to the sum of the indices of the singular points of the field. Now at M^2 on v - be vector field. $\mu : U(M^2) \to R^3$ is determine by use formula $\mu(x) = v(rx) + x - r(x)$. μ the field is imposed by the sum of the indices of the special points (Using Sadr's theorem).

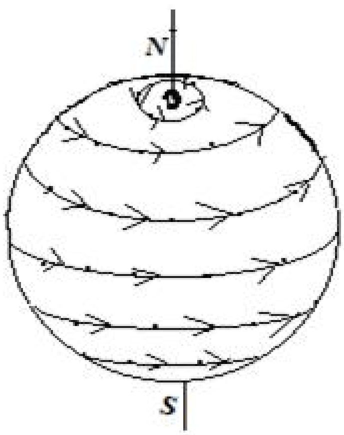
μ limit of field $\partial U(M^2)$ on the without special points $z(x) = x - r(x)$ will be gomotop to vector field. Where $\mu, \tilde{z}$ to get normal reflections equal of degree them.

$$\deg \mu = \deg \tilde{z}$$

and as a result of $\deg \mu$ and v we will do create not depend on the field.

Let's compare the above result with examples:

An example. In three-dimensional Euclidean space $x^2 + y^2 + z^2 = 1$ we saw sphere. This is sphere $X = \{y, -x, 0\}$ specified vector field (pic-1).



This vector field has two distinct points: the north and south poles (pic-1). Each of the index is equal to +1. In this case, the sum of the indices of the singular points of the vector field in the sphere is 2.

Now we look at $f : S^2 \to R^1$. If we look at the field of the gradient vector in this sphere. $\dot{x} = gradf$ this vector has special two points vector of field: they are southern and northern. Indices of each of these special points are equal to +1. That is, the sum of the indices of the special points in this field is equal to 2.

This means that the sum of the indices of the field points in the sphere does not depend on the choice of the vector field.

LIST OF USE LITERATURE

1. B.A.Dubrovin, S.P. Novikov, A.T. Fomenko Modern geometry Moscow “science” 1979;
2. V.I. Arnold Ordinary Differential Equations: Science 1975
3. A.S. Mishchenko, Yu.P. Soloviev, A.T. Fomenko Collection of problems in differential geometry and topology Moscow 1981