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BIFURCATION OF CLOSED GEODESICS

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Abstract. This paper is denoted to further study of geodesic bifurcation on surfaces of revolution. We demonstrate an example of bifurcation of closed geodesics on surfaces.

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1. Introduction

Geodesics are special curves that play important role in differential geometry. These curves were studied in many works, see [1–3, 5, 6, 8, 10].

We studied geodesic bifurcations in our paper [9]. Here, we describe problem about geodesics. We found and example of geodesic bifurcation on certain surface of revolution. We explain the term bifurcation as a situation when at least two different geodesics go through the given point in the given direction.

This term was also used but with a different meaning, see [11]. There, geodesic bifurcation is understood as situation when more geodesic go through given point but do not have the same tangent vector.

The result of our study is a construction of surface of revolution where exist closed geodesics which admit above described geodesic bifurcation.

2. Geodesics

Let (M, ∇) be a manifold M with affine connection ∇. In local chart (U, x) the connection ∇ is defined with its components $\Gamma^h_{ij}(x)$.