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LAPLACE-BELTRAMI OPERATOR OF A HELICOIDAL HYPERSURFACE IN FOUR-SPACE

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Abstract. We introduce helicoidal hypersurface in the four dimensional Euclidean space. We calculate the mean and the Gaussian curvature, and some relations of the helicoidal hypersurface. Then we give the Laplace-Beltrami operator of the helicoidal hypersurface.

MSC: Primary 53A35; Secondary 53C42
Keywords: Gaussian curvature, Helicoidal hypersurface, Laplace-Beltrami operator, mean curvature

Contents

1. Introduction

The notion of finite type immersion of submanifolds of a Euclidean space has been used in classifying and characterizing well known Riemannian submanifolds [3]. Chen [3] posed the problem of classifying the finite type surfaces in the three-dimensional Euclidean space $\mathbb{E}^3$. A Euclidean submanifold is said to be of Chen finite type if its coordinate functions are a finite sum of eigenfunctions of its Laplacian Δ.