Classification of surfaces of finite Chen type

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Abstract

In the present thesis we first give a brief glance on curves and surfaces in the Euclidean 3-space and some basic concepts regarding them. Also, as examples on surfaces in the Euclidean 3-space, we define special and important classes of surfaces, namely, surfaces of revolution, translation surfaces, ruled surfaces and quadrics. Next, we deal with the concept of surfaces of finite type and give a historic glance on this field regarding the fundamental forms *I*, *II* and *III* of a surface. Finally, we focus on quadric surfaces from two sides. On one side, we study quadric surfaces whose position vector x satisfies a relation of the form $\Delta^{II}x = Ax$, where A is a square matrix of order 3 and Δ is the second Laplace operator.

On the other side, we study quadric surfaces whose normal vector n satisfies $\Delta^{II}n = An$, where A is a square matrix of order 3 and Δ is the second Laplace operator.

Keywords: Quadric surfaces, Finite Chen type surfaces, Euclidean 3-space, Curves and surfaces in 3-space.