

Surfaces in R^7 obtained from harmonic maps in S^6

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We will discuss the local geometry of surfaces in the 7- dimensional Euclidean space obtained from harmonic maps from a Riemann surface Σ into S^6 . In this setting, the harmonicity of a smooth map $\varphi : \Sigma \rightarrow S^6$ amounts to the closeness of the differential 1-form $\omega = \varphi \times *d\varphi$, where \times stands for the 7-dimensional cross product. This means that we can integrate on simply- connected domains in order to obtain a map $F : \Sigma \rightarrow \mathbb{R}^7$. By applying methods based on the use of harmonic sequences, we will characterize the conformal harmonic immersions φ whose associated immersions F in \mathbb{R}^7 belong to certain remarkable classes of surfaces, namely: minimal surfaces; pseudo-umbilical surfaces; surfaces with parallel mean curvature vector field; isotropic surfaces.
