

A Weierstrass type representation of Constrained Willmore surfaces.

In a first part, we present a joint work with Josef Dorfmeister : a Weierstrass type representation for constrained Willmore surfaces in spheres. Using appropriate (moving) frames and an appropriate Lie algebra decomposition of $\mathfrak{so}(1,n+3)$, we translate the PDE of constrained Willmore surfaces into the Lie algebra setting : namely we rewrite it as a Maurer-Cartan equation of an extended Maurer Cartan form of the frame associated to the surface. Then using some “Bruhat” decomposition of $SO(1,3)$, we consider appropriate versions of the Iwasawa and the Birkhoff decompositions of the loop group. This allows us to construct a DPW algorithm for constrained Willmore surfaces and hence to obtain a Weierstrass type representation for these surfaces in terms of holomorphic (or meromorphic) potentials. In a second part, we characterize the conformal Gauss maps of constrained Willmore surfaces (personal work) : in particular, we generalize a theorem of Dorfmeister and Wang for Willmore surfaces to constrained Willmore surfaces.

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