Mathematics > Differential Geometry

Projectively deformable Legendrian surfaces

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(Submitted on 21 Jul 2011)

Consider an immersed Legendrian surface in the five dimensional complex projective space equipped with the standard homogeneous contact structure. We introduce a class of fourth order projective Legendrian deformation called \emph{$\,\Psi$-deformation}, and give a differential geometric characterization of surfaces admitting maximum three parameter family of such deformations. Two explicit examples of maximally $\, \Psi$-deformable surfaces are constructed; the first one is given by a Legendrian map from $\, \PP^2$ blown up at three distinct collinear points, which is an embedding away from the -2-curve and degenerates to a point along the -2-curve. The second one is a Legendrian embedding of the degree 6 del Pezzo surface, $\, \PP^2$ blown up at three non-collinear points. In both cases, the Legendrian map is given by a system of cubics through the three points, which is a subsystem of the anti-canonical system.

Comments:	33 pages
Subjects:	**Differential Geometry (math.DG)**
MSC classes:	53A20
Cite as:	**arXiv:1107.4158** [math.DG]
	(or **arXiv:1107.4158v1** [math.DG] for this version)

Submission history

From: Joe S. Wang [view email]

[v1] Thu, 21 Jul 2011 05:00:49 GMT (34kb)

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