

Principal curvature configurations on surfaces and hypersurfaces in Euclidean spaces.

Jorge Sotomayor¹

¹ Universidade de São Paulo, Instituto de Matemática e Estatística

We depart from an appropriate reformulation of classical results of G. Monge and G. Darboux, which, after a suitable elaboration, led to the study of a class Σ of immersions of a compact oriented surface M^2 into \mathbb{R}^3 with the property that they are structurally stable with respect to their principal curvature configurations. This configuration consists of the umbilic points, as singularities, and of the pair of principal curvature families of curves defined on the complement of such points.

The work of Gutiérrez and Sotomayor established that in the space of immersions C^4 smooth, the class Σ is open in class C^3 and dense in class C^2 . See [1], [2] and [3]. The class Σ is reminiscent of the class of Andronov - Pontrjagin and Peixoto flows on surfaces.

In the present lecture will be reported recent developments and inquiries focusing the structural stability and genericity of principal curvature configurations increasing the dimensions of the target space and of the domain space.

References

- [1] DARBOUX, G. , *Sur la forme des lignes de courbure dans la voisinage d'un ombilic.* , Leçons sur la Theorie des Surfaces, Note 7, Gauthier Villars, Paris, 1896.
- [2] GUTIÉRREZ, C. AND SOTOMAYOR, J. , *Structurally stable configurations of lines of principal curvature.* , Asterisque, Soc. Math. de France, Vol. 98-9, 1982.
- [3] GARCIA, R. AND SOTOMAYOR, J. , *Historical comments on Monge's ellipsoid and the configurations of lines of principal curvature in Euclidean spaces.* , Antiquitates Mathematicae, Vol. 10, 2016.