

Equiaffine Darboux frames for codimension 2 submanifolds contained in hypersurfaces

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(Joint work with Marcelo J. Saia and Luis F. Sánchez)

For a curve γ contained in a surface M of the affine 3-space, it is not difficult to construct a vector field tangent to M and transversal to γ whose derivative in the γ direction is tangent to γ . Based on this vector field, one can describe the singularities of the tangent developable surface of M along γ . Our aim is to generalize this construction to a codimension 2 immersion N contained in a hypersurface M .

There are some important examples of submanifolds that admit a vector field tangent to M and transversal to N whose derivative in any direction of N is contained in N . When this is the case, one can construct transversal plane bundles and affine metrics on N with the desirable properties of being equiaffine and apolar. Moreover, this transversal bundle coincides with the classical notion of Transon plane. But we also give an explicit example of a submanifold that do not admit a vector field with the above property. In fact, we prove that the existence of such a vector field is equivalent to the flatness of the affine normal bundle connection.