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On almost-Riemannian surfaces. (Sur les surfaces presque riemanniennes.) (English. French summary) [[Zbl 1376.49062](#)]

Actes de Séminaire de Théorie Spectrale et Géométrie. Année 2010–2011. St. Martin d'Hères: Université de Grenoble I, Institut Fourier. Séminaire de Théorie Spectrale et Géométrie 29, 15–49 (2011).

Summary: An almost-Riemannian structure on a surface is a generalized Riemannian structure whose local orthonormal frames are given by Lie bracket generating pairs of vector fields that can become collinear. The distribution generated locally by orthonormal frames has maximal rank at almost every point of the surface, but in general it has rank 1 on a nonempty set which is generically a smooth curve. In this paper, we provide a short introduction to 2-dimensional almost-Riemannian geometry highlighting its novelties with respect to Riemannian geometry. We present some results that investigate topological, metric and geometric aspects of almost-Riemannian surfaces from a local and global point of view.

For the entire collection see [[Zbl 1356.35008](#)].

MSC:

[49Q99](#) Manifolds and measure-geometric topics

[53C17](#) Sub-Riemannian geometry

[34K35](#) Control problems for functional-differential equations

[49J15](#) Existence theories for optimal control problems involving ordinary differential equations

Keywords:

almost-Riemannian geometry; geodesics; Grushin plane; Lipschitz classification; Pontryagin maximum principle; Gauss-Bonnet formula; control theory

Full Text: [DOI](#) [arXiv](#)