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8. Analysis

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On Jurchescu's mixed manifolds

With the aim to realize a synthesis between analytic and differential geometries Martin Jurchescu introduced and deeply studied mixed structures. Thus in 1976 he defined the mixed manifolds of type (m, n), having as local models open sets in $R^m \times C^n$ and as morphic maps C^∞-mappings holomorphic in the complex variables. He generalized for them (especially for his Cartan manifolds) the pluridimensional complex analysis.

However other analysis theories can be also developed on Jurchescu's mixed manifolds. Thus I proposed to Elena Ruso, a doctorand from the Technical University of Moldavia, Chişinău, to study quasiconformality and quasiregularity on these manifolds. By using Markushevich–Pesin's definition, respectively in quasiregular case the Reshetnyak one, and A. P. Karmazin's compatibility of mappings, she obtained interesting results on quasiformal and quasiregular morphic maps.

Now we present a joint work on this subject renouncing to the C^∞-smoothness of the considered quasiregular maps.

Let (s, z) and (s', z') be points, and D, D' open sets in $\mathbb{R}^m \times \mathbb{C}^n$ respectively. We deal with mappings $f : D \to D'$ having the structure of the morphic maps, i. e. of the form $f(s, z) = (\varphi(s), \psi(s, z))$, $s' = \varphi(s)$, $z' = \psi(s, z)$. We study topological and metrical properties of φ and ψ under the hypothesis that f be quasiregular or have the topological properties of a quasiregular map, and conversely, how such properties of φ and ψ are reflected on f.