Complex geodesics in tube domains and their role in the study of harmonic mappings in the disc

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The continuation of the research initiated by S. Zając on the structure of complex geodesics in tube domains over (bounded) convex bases will be presented. In some special cases a more explicit form of the geodesics than the existing ones are provided. As one of the consequences of the study an effective formula for the Kobayashi-Royden metric in the tube domain over the unit ball at the origin is given. The results on the Kobayashi-Royden metric in a natural way provide versions of the Schwarz Lemma for harmonic mappings. A result on harmonic mappings defined on the disc that may be seen as a generalization of the Radó-Kneser-Choquet Theorem for a class of harmonic bivalent mappings that lets understand better the geometry of complex geodesics in tube domains will also be presented.