

# Geodesics and almost geodesics curves

Olga Belova, Josef Mikeš and Karl Strambach

Budapest, February 3–4, 2017

## Abstract

Geodesics are classical objects of differential geometry. They are invariants for geodesic mappings. Already E. Beltrami has shown that a differentiable curve is a local geodesic with respect to an affine connection  $\nabla$  precisely if it is a solution of an Abelian differential equation with coefficients which are functions of the components of  $\nabla$ .

Almost geodesics curves and mappings have been introduced in 1963 by N.S. Sinyukov as generalizations of geodesic curves and mappings.

We determine in  $\mathbb{R}^n$  the form of curves  $\mathcal{C}$  for which also any image under an  $(n - 1)$ -dimensional algebraic torus is a geodesic or an almost geodesic with respect to an affine connections  $\nabla$  with constant coefficients and calculate explicitly the components of  $\nabla$ .

Olga Belova,  
Institute of Physical and Mathematical Sciences and IT,  
Immanuel Kant Baltic Federal University,  
A. Nevsky str. 14, 236041, Kaliningrad, Russia,  
e-mail: olgaobelova@mail.ru

Josef Mikeš,  
Department of Algebra and Geometry, Fac. of Sci., Palacky Univ.,  
Tomkova 40, 779 00 Olomouc, Czech Republic,  
e-mail: josef.mikes@upol.cz;

Karl Strambach,  
Department Mathematik der Universität Erlangen-Nürnberg  
Cauerstr. 11  
D-91054 Erlangen, Germany,  
e-mail: strambach@mi.uni-erlangen.de