cases	doc_1	doc_2	decision	id

doc_1

authors	• J. Lankeit • P. Neff • Frank Osterbrink
title	Integrability conditions between the first and second Cosserat deformation tensor in geometrically nonlinear micropolar models and existence of minimizers
publication_date	2016-12-18 00:00:00
source	SupportedSources.SEMANTIC_SCHOLAR
journal	Zeitschrift fÃ¼r angewandte Mathematik und Physik
volume	68
doi	10.1007/s00033-016-0755-7
urls	• https://www.semanticscholar.org/paper/759e2c1b1cb8a47ad649ee6fca1cf2c1012356c9
id	id-3050276119689774862
abstract	None
versions	

doc_2

authors	• Johannes Lankeit • Patrizio Neff • Frank Osterbrink
title	Integrability conditions between the first and second Cosserat deformation tensor in geometrically nonlinear micropolar models and existence of minimizers
publication_date	2015-04-29 20:03:35+00:00
source	SupportedSources.ARXIV
journal	None
volume	
doi	
urls	• http://arxiv.org/pdf/1504.08003v1 • http://arxiv.org/abs/1504.08003v1 • http://arxiv.org/pdf/1504.08003v1
id	id-3748143012050796456
abstract	In this note we extend integrability conditions for the symmetric stretch tensor U in the polar decomposition of the deformation gradient $\nabla\varphi=F=R\,U$ to the non-symmetric case. In doing so we recover integrability conditions for the first Cosserat deformation tensor. Let $F=\bar R\,\bar U$ with $\bar R:\Omega\subset\mathbb{R}^3\longrightarrow\mathrm{SO}(3)$ and $\bar U:\Omega\subset\mathbb{R}^3\longrightarrow \mathrm{GL}(3)$. Then $\mathfrak{K}:={\bar R}^T\mathrm{Grad}\,{\bar R}=\mathrm{Anti}\Big(\frac{1}{\mathrm{det} \bar U}\Big[\bar U(\mathrm{Curl} \bar U)^T-\frac{1}{2} \mathrm{tr}(\bar U(\mathrm{Curl} \bar U)^T) 1\!\!1 \Big]\bar U\Big),$ giving a connection between the first Cosserat deformation tensor $\bar U$ and the second Cosserat tensor ${\mathfrak{K}}$. (Here, Anti denotes an isomorphism between $\mathbb{R}^{3\times 3}$ and $\mathfrak{So}(3):=\{\,\mathfrak{A}\in\mathbb{R}^{3\times 3\times 3}\,|\,\mathfrak{A}.u\in\mathfrak{so}(3)\;\forall u\in\mathbb{R}^3\}$.) The formula shows that it is not possible to prescribe $\bar U$ and $\mathfrak{K}$ independent from each other. We also propose a new energy formulation of geometrically nonlinear Cosserat models which completely separate the effects of nonsymmetric straining and curvature. For very weak constitutive assumptions (no direct boundary condition on rotations, zero Cosserat couple modulus, quadratic curvature energy) we show existence of minimizers in Sobolev-spaces.
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decision	id
DUPLICATES	1100