1. Record Nr. UNINA9911044011003321

Autore	Wasmer Paul
Titolo	On the treatment of finite rotations in the discretization of a geometrically exact beam model / / Paul Wasmer
Pubbl/distr/stampa	Karlsruhe : , : KIT Scientific Publishing, , 2025
Descrizione fisica	1 online resource
Collana	Schriftenreihe des Instituts fur Mechanik, Karlsruher Institut fur Technologie; ; 13
Soggetti	Finite element method Isogeometric analysis Rotational motion Quaternions
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di bibliografia	Includes bibliographical references and index.
Sommario/riassunto	This work examines the discretizations of finite rotations in the Finite Element Method and Isogeometric Analysis for geometrically exact beam theory. As demonstrated, classical discretization does not achieve optimal convergence behavior. Alternatively, projection-based elements and Gauss-Lobatto elements are explored for beam formulations using directors and quaternions. A formulation based on quaternions proves to be better suited due to its simpler discretization approach.