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Operational Tensors; 1.5.5 Isotropic Tensors; 1.6 Eigenvalues and Eigenvectors; 1.6.1 Eigenvalues and Eigenvectors of Second-Order Tensors
1.6.2 Spectral Representation and Elementary Tensor Functions 1.6.3 Calculation of Eigenvalues and Eigenvectors; 1.6.4 Eigenvalues and Vectors of Orthogonal Tensor; 1.6.5 Eigenvalues and Vectors of Skew-Symmetric Tensor and Axial Vector; 1.6.6 Cayley-Hamilton Theorem; 1.7 Polar Decomposition; 1.8 Isotropy; 1.8.1 Isotropic Material; 1.8.2 Representation Theorem of Isotropic Tensor-Valued Tensor Function; 1.9 Differential Formulae; 1.9.1 Partial Derivatives; 1.9.2 Directional Derivatives; 1.9.3 Taylor Expansion; 1.9.4 Time Derivatives in Lagrangian and Eulerian Descriptions
1.9.5 Derivatives of Tensor Field 1.9.6 Gauss's Divergence Theorem; 1.9.7 Material-Time Derivative of Volume Integration; 1.10 Variations and Rates of Geometrical Elements; 1.10.1 Variations of Line, Surface and Volume; 1.10.2 Rates of Changes of Surface and Volume; 1.11 Continuity and Smoothness Conditions; 1.11.1 Continuity Condition; 1.11.2 Smoothness Condition; 2 General (Curvilinear) Coordinate System; 2.1 Primary and Reciprocal Base Vectors; 2.2 Metric Tensors; 2.3 Representations of Vectors and Tensors; 2.4 Physical Components of Vectors and Tensors
2.5 Covariant Derivative of Base Vectors with Christoffel Symbol 2.6 Covariant Derivatives of Scalars, Vectors and Tensors; 2.7 Riemann-Christoffel Curvature Tensor; 2.8 Relations of Convected and Cartesian Coordinate Descriptions; 3 Description of Physical Quantities in Convected Coordinate System; 3.1 Necessity for Description in Embedded Coordinate System; 3.2 Embedded Base Vectors; 3.3 Deformation Gradient Tensor; 3.4 Pull-Back and Push-Forward Operations; 4 Strain and Strain Rate Tensors; 4.1 Deformation Tensors; 4.2 Strain Tensors; 4.2.1 Green and Almansi Strain Tensors
4.2.2 General Strain Tensors

Sommario/riassunto

Comprehensive introduction to finite elastoplasticity, addressing various analytical and numerical analyses & including state-of-the-art theories Introduction to Finite Elastoplasticity presents introductory explanations that can be readily understood by readers with only a basic knowledge of elastoplasticity, showing physical backgrounds of concepts in detail and derivation processes of almost all equations. The authors address various analytical and numerical finite strain analyses, including new theories developed in recent years, and explain fundamentals inclu