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Earthquake Source Asymmetry, Structural Media and Rotation Effects

This is the first book on rotational effects in earthquakes, a revolutionary concept in seismology. Existing models do not yet explain the significant rotational and twisting motions that occur during an earthquake and cause the failure of structures. This breakthrough monograph thoroughly investigates rotational waves, basing considerations on modern observations of strong rotational ground motions and detection of seismic rotational waves. The rotational effects are observed first of all near the earthquake sources, but not only; they also appear near seismic stations on account of the properties of media through which the waves propagate. To describe the propagation of such waves, the authors consider structured elastic media that allow for rotational motions and rotational deformations of the ground, sometimes stronger than translational deformations. The rotation and twist effects are investigated and described and their consequences for designing tall buildings and other important structures are presented. The book will change the way the world views earthquakes.

Contents: Macroseismic Rotation Effects and Micromotions.- Theory of Continua and Fields of Defects.- Rotation Motions, Seismic Source Models, and Asymmetry of Fracture.- Effects Related to Medium Structures and Complexity of Wave Propagation.- Seismic Rotational Motions: Recording Techniques and Data Analysis.- Rotations and Engineering Seismology.

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