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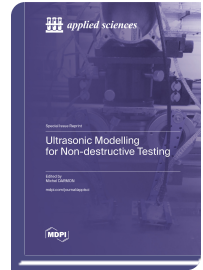
Ultrasonic Modelling for Non-destructive Testing

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Ultrasonic techniques are used for non-destructive purposes to assess the properties and state of structures designed for a wide range of applications (engineering, construction materials, medicine, etc.). Different types of material properties (mechanical, chemical, physical, biological, etc.) with different physical states/compositions (solid, liquid, heterogeneous, inhomogeneous, complex, moving, etc.) can be studied. This reprint delves into mutually dependent subfields including, but not restricted to, ultrasonic wave techniques for classical non-destructive testing (NDT) and structural health monitoring; new methods for imaging; ultrasonic characterization; non-linear acoustics; acoustic emission; laser ultrasonics; sensors; signal and noise analysis. This Special Issue explores notably some advances in ultrasonic modeling methods for understanding or predicting NDT inspections. The simulation tools developed can be based on different mathematical/physical theories or assumptions; for example, semi-analytical, numerical, and hybrid models can be used for direct simulation and model benchmarking, inversion theory for imaging and damage localization, as well as artificial intelligence. The reprint constructs a comprehensive collection of research and development trends that will serve as a convenient reference for NDT experts, as well as new practitioners.



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