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Nota di contenuto	Direct methods: History, present and future -- A unified shakedown limit equation for pavements and railways under repeated traffic loads -- Elastic-plastic optimisation of a cable-rib satellite antenna -- An introduction to the probabilistic linear matching method framework for structural integrity assessment under uncertain design conditions -- Peak load prediction of human bone proximal femur: sensitivity to tissues strength and geometry -- Graded damage solutions in one dimension -- Fatigue strength prediction of high silicon alloyed nodular cast iron by shakedown analysis -- A macroscopic fatigue criterion for ductile porous materials with Drucker-Prager dilatant matrix basing on the shakedown theory -- A direct method for cyclic crystal plasticity with application to high-cycle fatigue -- Masonry domes under complex loading conditions: A shell-based static limit analysis approach -- Robust optimization applied to uncertain limit analysis -- Advances of the RSDM-S: robusteness and convergence issues -- Mixed fiber elements and incremental-iterative algorithm for

shakedown and limit fire analysis of 3D frames.

Sommario/riassunto

This book provides an overview of direct methods, such as limit and shakedown analysis, which are intended for avoiding cumbersome step-by-step calculations to determine the limit states of mechanical structures under monotone, cyclic or variable actions with unknown loading history. The book comprises several contributions that demonstrate how tremendous advances in numerical methods, especially in optimization, have contributed to the success of direct methods and their applicability to practical engineering problems in structural mechanics and mechanics of materials. The contents reflect the outcomes of the workshop “Direct Methods for Limit State of Materials and Structures,” held in Cosenza, Italy in June 2022.