

From Performance-Based Engineering to Earthquake Resilience

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Abstract

Performance-based earthquake engineering has matured over the past twenty years from a conceptual framework into a formal methodology that can enable quantitative assessment of the seismic risks to buildings and infrastructure. Enabled by advanced nonlinear analysis, performance-based methods provide for more transparent design and decision making that takes advantage of the latest research in characterizing earthquake ground motion hazards, simulating structural behavior, and assessing earthquake damage and its consequences. Performance-based approaches are facilitating the design of innovative structures and influencing building code requirements and public policies for earthquake safety. Yet, many challenges remain to evaluate recovery from earthquake damage and implications on the socio-economic health of society. This talk will examine the major developments in performance-based earthquake engineering and ways it is being applied to reduce earthquake risks and improve earthquake resilience.

Short Bio



Greg Deierlein is the John A. Blume Professor of Engineering at Stanford University where he directs the Blume Earthquake Engineering Center. Deierlein previously served as the deputy director for the Pacific Earthquake Engineering Research (PEER) Center where he managed research to develop performance-based earthquake engineering methods and enabling technologies. Deierlein specializes in the design and behavior of structures, nonlinear structural analysis, computational fracture and damage mechanics, and performance-based earthquake engineering. He is a registered professional engineer and maintains professional activities as a structural engineering consultant and in building code standards development. In 2013, he was elected to the US National Academy of Engineering for his contributions to the use of nonlinear analysis in structural design.

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