

Invited Oral Presentation

## Modelling of seismic risks based on displacement

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**Nelson Lam** is Associate Professor and Reader at the University of Melbourne. He graduated with a Bachelor degree in civil engineering from Leeds University (UK), a Master of Science degree from Imperial College of Science & Technology, University of London and a PhD degree from University of Melbourne. Prior to commencing his academic career at the University of Melbourne in 1989 he was with Scott Wilson Inc. as a chartered structural engineer. For the past 16 years, he has been researching and consulting widely in the area of earthquake engineering and has been awarded the Chapman medal by the Institution of Engineers Australia. He is a member of the Australian Standard sub-committee BD6/11 responsible for revising the new earthquake loading standard for Australia and the re-writing of the commentary.

### ABSTRACT

The presentation begins with an introduction to the displacement-based seismic design and assessment approach which has distinct potential advantages when adapted to regions of low and moderate seismicity, like Australia. The various challenges currently encountered by researchers in the modelling of seismic risks are then discussed. The main thrust of the discussion is concerned with difficulties in modelling earthquake occurrence in Australia which has a paucity of data spanning over a relatively short time-frame. Other topics to be discussed include modelling for the attenuation behaviour of seismic waves, soil amplification, effects of vertical acceleration, structural response and ultimate behaviour. Deficiencies with the current models in accurately modelling seismic risks are highlighted and recommendations for facilitating effective modelling for the future are provided. The displacement-based design methodology in the context of day-to-day engineering design will also be discussed. Thus, the presentation should be of interests to researchers working in the seismology and engineering disciplines as well as to engineering practitioners.