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On the Very-High Cycle Fatigue in Metallic Materials

By

Professor Youshi Hong

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Chinese Academy of Sciences, Beijing, China

Date: Wednesday, 26 June 2019
Time: 10:00 am to 11.00 am
Venue: EA #02-11
Block EA, 9 Engineering Drive 1,
Singapore 117575
Faculty of Engineering,
National University of Singapore

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Abstract

Fatigue failure of metallic materials may happen at a stress below conventional fatigue limit and the fatigue life is beyond 10^7 cycles, which is the new research regime of very-high-cycle fatigue (VHCF). The significance of VHCF research is of two folds. On the one hand, the mechanism of crack initiation and propagation for VHCF defers from that for high-cycle and low-cycle fatigue, for which the new mechanism needs to be revealed. On the other hand, engineering structures and components, such as airplanes, high-speed trains and suspension bridges, require more than 10^7 cycles of safe performance. This presentation is about the newly advances and the encountered challenges in VHCF issues, which will share with you with the following parts: What is VHCF? Why VHCF is investigated? What are the essential characteristics of VHCF? What are the newly advances and encountered challenges in VHCF?

Speaker Biography

Youshi Hong is a Professor of the Institute of Mechanics (IMECH), Chinese Academy of Sciences (CAS). He was the Director of IMECH-CAS between 1998 and 2006. He has been the Editor-in-Chief for Fatigue & Fracture of Engineering Materials & Structures (FFEMS) since 2012. He was elected as an academician of Asia Pacific Academy of Materials Science in 2017.

His research fields are mechanical behavior of materials, fracture

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mechanics and structure mechanics. His main research achievements are related to: high-cycle and very-high-cycle fatigue behavior of metallic materials; effects of second phase particles on deformation, fracture and stress corrosion cracking of steels; analyses of stress intensity factors and plastic zone sizes for notch-cracks and fatigue crack growth from a circular notch under biaxial stress; mechanism and modeling of collective damage evolution process of initiation and propagation for short fatigue cracks; and mechanical behavior of nano-crystalline metallic materials. He has published 320 papers in academic journals and conference proceedings, and obtained 15 Chinese patents. He received a First Grade Award of Natural Science of CAS, a National Second Grade Award of Natural Science, and a Second Grade Award of Natural Science of Chinese Society of Theoretical and Applied Mechanics.

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*****Seats are limited. Please register early. All are welcome and admission is free*****

Location