Materials Science & Engineering

seminar

Mechanical Properties of Al/SiC Nanolaminates as a Function of Individual Layer Thickness and Loading Orientation

August 28, 2015 at 1:30pm in ISTB 4 Room 240

abstract

Nanoindentation and other related micro and nanomechanical testing techniques have been the subject of extensive research in the last twenty years. Much of the work up to date has focused on utilizing these techniques to unravel mechanical size effects at the micro and nanoscales. However, testing at the microscale offers other benefits, including fast material development routines, as the amount of material required for testing is reduced, and the possibility of measuring the individual constituents in complex microstructures, so that this information can be utilize to inform microstructurally based multiscale material models, thus facilitating virtual testing strategies towards a fast and robust computational materials engineering approach. The Experimental Micro and Nanomechanics group at IMDEA Materials Institute leads a number of research projects in this direction. Fulfilling our objectives require a full understanding of the consequences of testing miniaturized samples, so that macroscopillay relevant data can be obtained, as well as further development of the techniques, to measure at different ambient conditions, such as high temperature, to measure closer to the real operation conditions. Examples of this strategy will be presented, focusing on recent work that we have carried out on Al/SiC nanolaminates in collaboration with the group of Prof. Nik Chawla, under a collaborative project funded by the Materials World Network.

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Nanomechanics and Micromechanics of Advance Materials

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biosketch

Jon M. Molina-Aldareguia is Senior Researcher and leader of the research group in Nanomechanics and Micromechanics of Advanced Materials at IMDEA Materials Institute. He got his Ph.D. at Cambridge University in 2002. Before joining IMDEA Materials Institute in 2008, he was tenured researcher at CEIT and Associate Professor of Materials Science at the University of Navarre. He has held post-doctoral positions at the Department of Physics, University of Linköping and Intel Corporation. His current research interests are focused in the mechanical testing and the study of deformation mechanisms of advanced structural materials at different length scales, from macroscopic to the μm and nm scale, with the aim of understanding deformation mechanisms and measuring fundamental deformation behavior that can later be used as input in multiscale models of material behavior. He has participated on over 20 research projects and has published over 80 papers in international journals, holding a h-index of 19.