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Heating and melting induced by surface plasmon on a metal

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This study is thus to predict heating and melting of a workpiece with a self-consistent, deformable free surface subject to a surface plasmon induced by a pulsed laser in TM mode. A surface plasmon on a metal surface can be excited by an incident laser beam in a TM mode. The TM mode represents that magnetic field is perpendicular to the incident plane of electrical field. The surface plasma wave is an electromagnetic wave that propagates at the boundary between two media, leading to a distributed heat input on the surface. A systematical investigation of heating and melting of micro-scaled components in various plasma processing and nanotechnology is therefore provided.

Biography

Peng-Sheng Wei received PhD in Mechanical Engineering Department at University of California, Davis. He is now a Professor in the Department of Mechanical and Electro-Mechanical Engineering of National Sun Yat-Sen University (NSYSU), Kaohsiung, Taiwan. He has contributed to advancing the understanding of and to the applications of electron and laser beam, plasma, and resistance welding through theoretical analyses coupled with verification experiments. Investigations also include studies of their thermal and fluid flow processes, and formations of the defects such as humping, rippling, spiking and porosity. He has published more than 80 journal papers. He is Fellow of AWS and ASME. He also received the Outstanding Research Achievement Awards from both the National Science Council (NSC), and NSYSU, the Outstanding Scholar Research Project Winner Award from NSC, the Adams Memorial Membership Award, the Warren F. Savage Memorial Award, and the William Irrgang Memorial Award from American Welding Society (AWS). He has been the Xi-Wan Chair Professor of NSYSU, and Invited Distinguished Professor in the Beijing University of Technology, China.

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