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The effects of laser characteristics on melting of nano-particles on a surface

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This study numerically investigates transport processes during the melting of an array of nanoparticles on a surface subject to an electromagnetic wave or laser beam in a transverse magnetic (TM) mode. The TM mode represents magnetic field to be perpendicular to the incident plane of electrical field. A systematical investigation of heating and melting of an array of nanoparticles on a surface is essentially required to understand 3-D printing and different types of plasma processing and nanotechnology. The results show that electromagnetic wave propagating along the boundary between two media leads to a distributed heat input and magnetic force on the surface. Fluid flow and heat transfer associated with surface deformation result in complicated transport phenomena between nanoparticles, especially for different frequencies and radii of incident electromagnetic wave.

Biography

Peng-Sheng Wei completed his PhD in Mechanical Engineering department at University of California, Davis, in 1984. He has been a Professor in Department of Mechanical and Electro-Mechanical Engineering of National Sun Yat-Sen University, Kaohsiung, Taiwan, since 1989. 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. He has published more than 80 journal papers and given keynote or invited speeches in international conferences more than 70 times. He was a Fellow of American Welding Society (AWS) in 2007 and a Fellow of American Society of Mechanical Engineers (ASME) in 2000. He has been the Xi-Wan Chair Professor at National Sun Yat-sen University (NSYSU) since 2009.

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