عنوان مقاله:

Development of surface deformation of elastic-olastic solids under Vickers indentation

محل انتشار:

سیزدهمین کنفرانس سالانه مهندسی مکانیک (سال: 1384)

تعداد صفحات اصل مقاله: 9

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خلاصه مقاله:

Finite element modeling has been used to study the development of pile-up during indentation with a Vickers indenter as it relates to the measurement of mechanical properties by load and depth sensing indentation. A wide range of materials with different elastic modulus and yield stresses were examined. Results show that in a pyramidal indentation process, for a perfect plastic material (hardening exponent, n = 0) sinking-in during loading can change to pileup in unloading. This phenomenon depends on the elastic modulus to yield stress ratio. Results also show that the amount of pile-up cannot be related solely to the strainhardening exponent, as is often assumed. Rather, after initially sinking-in at small depths of penetration, the pile-up for many materials evolves and increases gradually as the indenter is driven into the material. Implications for the measurement of mechanical properties by load and depth sensing indentation methods are discussed.

کلمات کلیدی:

Computer simulation, Hardness, Vickers, Indentation, Finite element.