Numerical simulation of wear-mechanism maps

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Abstract-

Wear-mechanisms maps for different materials, actually steel on steel, are being modeled with FEM. A mico-thermo-mechanical approach has been used in order to model accurately the macroscopic phenomena of wear. A plastic law for the normal micromechanical contact of asperities has been implemented in FEAP and a slight modification, based on experimental results, is proposed. For the three mechanisms modeled, good correlation between the numerical results of wear and those found in literature has been obtained for a pin-on-disk configuration. The flash temperatures reached in the contact interface have been also studied and fair good agreement with literature is achieved.

Index Terms- Wear model, contact, friction, metal-to-metal, micromechanics, finite elements

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