

Mechanics of adhesion of spherical surfaces

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Abstract

The lecture will review developments in the mechanics of adhesion of spherical surfaces under the action of surface forces. For elastic solids and reversible surface forces the contact mechanics of adhesion of spheres was well founded in the 1970s by the combination of Derjaguin's group in Moscow (DMT), Tabor's group in Cambridge (JKR) and Maugis in Paris. The observation of rate dependency and so called 'adhesion hysteresis' has led to an on-going research effort to extend these results to viscoelastic materials. Further questions arise from capillarity of a surrounding fluid and irreversibility in the adhesive forces. Finally adhesion of elastic-plastic solids has relevance to the adhesion of rough surfaces.