Asperity deformation during running-in

Asperities loaded in pure rolling against a hard, smooth surface will often be deformed at the first contact event and will thereby experience high normal stress, presumably of a magnitude near the Vickers hardness of the softer material. Continued running-in can be imagined to develop into lower stress levels and an increase of contact area. An asperity model simulating a running-in process of rough surfaces with lengthy protractions in the rolling direction was investigated. After a limited range of only about 104 contact events a state of very low deformation rate was found.