Contact Modelling in the Vicinity of an Edge

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Abstract

In the paper the problem of a spherical contact in the vicinity of an edge will be considered by analytical modelling and nanoindentation experiments. This problem attracts interest because of the increasing use of nanoindentation as a tool for the investigation of mechanical property profiles of cross-sectioned samples. The paper is separated into three parts: first, a short introduction will be given into the problem of the theoretical modelling and the mathematical procedures necessary to solve load problems for so called quarter spaces, which deal as a model for rectangular bound bodies. In a second part the effect of the edge and its distance from the contact centre on the measurable parameters indentation depth and force are discussed with experimental results obtained using a UMIS-2000 nanoindenter system. Finally an illustration of the elastic stress and displacement field resulting from a Hertzian load in the vicinity of an edge is given.