

## Multiscale modelling of contact interactions

Contact interactions are accompanied by multiple phenomena such as friction, lubrication, wear, frictional heat generation and heat transfer through contact interface. Behaviour and effective properties observed at the macro-scale result from complex processes occurring at the micro- and nano-scale. These processes are related to interaction of surface asperities, inhomogeneity of bulk materials, formation of surface layers, etc.

The research topic proposed for this PhD project is concerned with development of methods of multiscale analysis of contact phenomena. The area of targeted applications includes advanced metal-ceramic composites and composite coatings.

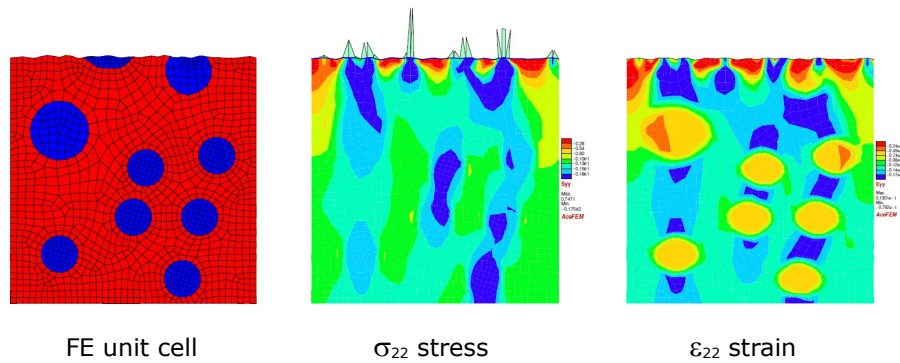


Figure: Micro-scale analysis of a contact layer of metal-ceramic composite.

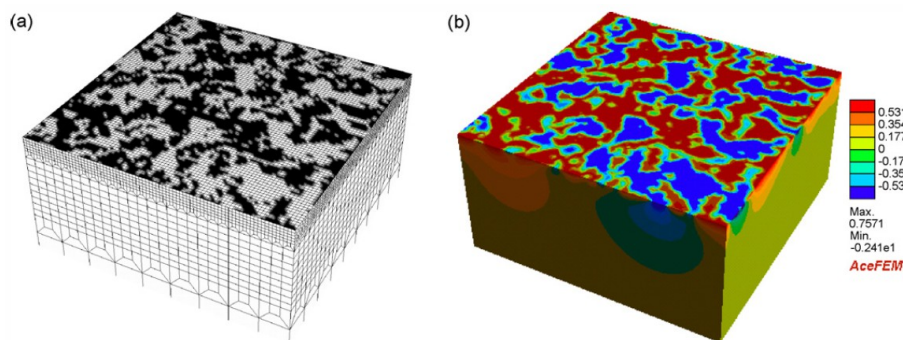


Figure: Representative element of a contact layer: (a) FE mesh, (b) fluctuations of temperature at a rough contact interface.

**Keywords:** micromechanics, contact mechanics, finite element method

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