



## ***Bio-inspired simulation of crack-network development in steel bearings***

(Master / Diploma thesis)

Materials of bearings, e.g. steel, fail due to catastrophic evolution of crack-networks inside the material in a very early state of use (see Figures). Morphology and chemistry of the material change are known by detailed microstructure analysis. However, processes that lead to crack-network formation in polyphase systems are not yet understood and are of greatest importance for developing more durable bearings.

The aim of the work is to derive a model describing how crack-networks may evolve in polyphase systems. Phases and morphologies are known by microstructural investigations and will be given as entry parameters.

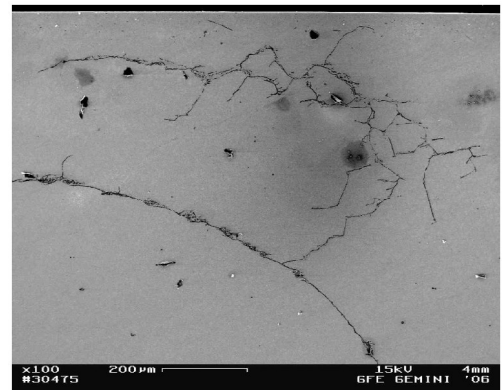


Figure 1: Typical crack-network in the subsurface region of polyphase steel after short-time running in field application.

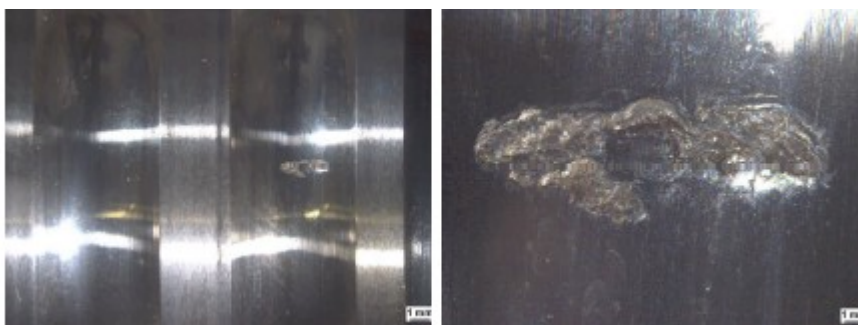


Figure 2: Ball-bearing of a car, damaged due to crack-network development.

### ***Kontakt:***

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