

## Modelling of Short Fatigue Crack Growth in a Metal in HCF Range

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Modelling of short fatigue crack growth in a polycrystalline metal in high cycle fatigue range (HCF) is the subject of the paper. Special attention is paid on the short crack behaviour under reversed cyclic torsion. Short fatigue crack growth is analysed in three stages: as a small crack of a size comparable to the grain size (stage I), a microstructurally short crack (stage I-like) and a physically short crack (stage II). Stages I and I-like crack growth are strongly microstructurally depended and the crack advances under mode II. To predict stage-I and stage I-like crack growth a fracture mechanics approach is adopted here. On the contrary, stage II crack growth is modelled using a probabilistic approach. Main equations of dynamics of stage II crack growth are both the Fokker-Planck partial differential equation and the propagation equation by means of crack tip opening displacement defined on the base of the Dugdale-Barenblatt model.

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