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Low Cycle Fatigue Based on Unilateral Damage Evolution

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The present paper deals with a modelling of low cycle fatigue of AISI 316L stainless steel with aid of kinetic law of unilateral damage evolution. The classical theory by Lemaitre and Chaboche is extended in order to take into account two separate damage mechanisms, unilateral damage effect, continuous crack closure/opening effect and simplified description of the neck mechanism. Results of numerical simulation are compared and verified in order to achieve the best agreement with the experimental data. Detail quantitative and qualitative analysis of obtained solutions confirms necessity and correctness of an application of continuous microcrack closure/opening effect.

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