



### **Science Arts & Métiers (SAM)**

is an open access repository that collects the work of Arts et Métiers Institute of Technology researchers and makes it freely available over the web where possible.

This is an author-deposited version published in: <https://sam.ensam.eu>  
Handle ID: [.http://hdl.handle.net/10985/19148](http://hdl.handle.net/10985/19148)

#### **To cite this version :**

Véronique DOQUET, Gilbert HENAFF, Thierry PALIN-LUC, Marion RISBET - Fatigue Crack Initiation and Propagation - 2019

Any correspondence concerning this service should be sent to the repository

Administrator : [scienceouverte@ensam.eu](mailto:scienceouverte@ensam.eu)





## Chapter 4 – Fatigue Crack Initiation and Propagation

Véronique DOQUET, Laboratoire de Mécanique des Solides LMS

Gilbert HÉNAFF, ISAE-ENSMA

Thierry PALIN-LUC, Arts et Metiers Institute of Technology – I2M

Marion RISBET, Université de Technologie de Compiègne, UTC

<https://doi.org/10.1016/B978-1-78548-309-7.50004-1>

### Abstract

The resistance of metal alloys to fatigue can be classified into four major regimes: low-cycle fatigue (or short life), limited resistance (between  $10^5$  and  $10^6$  cycles), high-cycle fatigue (between  $10^6$  and  $10^7$  cycles) and gigacycle (more than  $10^7$  cycles). This chapter introduces the basic concepts of cyclic mechanical behavior, crack initiation and propagation in these different regimes.

### Keywords

Crack path ; Fatigue Crack Initiation ; Fatigue crack propagation ; Gigacycle fatigue ; High-cycle fatigue tests ; Interaction between modes ; Mixed-mode fatigue crack growth ; Multiaxial fatigue ; Plastic or low-cycle fatigue tests

In : Mechanics - Microstructure - Corrosion Coupling, Christian Blanc, Isabelle Aubert, ISTE Press - Elsevier, 2019, ISBN 9781785483097 - <https://doi.org/10.1016/C2018-0-05006-9>