

WORKSHOP

20 July 2017
room 126

Multiaxial Fatigue

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Abstract

Il seminario affronta il calcolo, basato su FEM, della Fatica Multiassiale. Dopo una breve introduzione sulla fatica uniassiale, si entra nel dettaglio di ogni fase del processo di calcolo, dall'estrazione carichi, all'assemblaggio della time history elastica, al calcolo della time history elasto-plastica, al calcolo della vita del componente. I metodi stato dell'arte sono discussi in dettaglio. Enfasi e' data al calcolo con « critical plane approach » (Low cycle fatigue: Glinka-Buczynsky incremental Neuber/ESED method, Pseudo-Material per il calcolo della plasticita' ciclica con parametri di fatica di Smith-Watson-Topper o Famei-Socie o Brown-Miller). High cycle fatigue. Si mostrano brevemente anche altri approcci come il Dang-Van.

Program

- 10.00 **Welcome and Workshop introduction**
- **Prof. Renato Esposito** – Machine Design Group, Faculty of Engineering, University of Salerno,
 - **Ing. Oscar Pio Carrozzo** – *Aeropolis rep.*
- 10.15 **Uniaxial fatigue and first part of Multiaxial Fatigue**
- 11.30 **Break**
- 11.45 **Second part of Multiaxial Fatigue**
- 13.00 **Discussion**
- 13.30 **End of seminar**

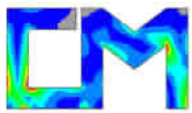
Workshop organisation

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Table of Contents

Introduction

Fatigue in Metallic Components

Uniaxial Fatigue

Analysis Process

High and Low Cycle Fatigue (S-N model and e-N model)

Mean stress correction methods

Stress Concentration and Notch Factor

Elastic-Plastic stress calculation (Neuber and Glinka rules)

Fatigue Spectra and Time Histories

Filtering (racetrack Filter)

Spectrum, cycles, Rain-flow counting

Multiaxial Fatigue

Analysis Process

2D, 3D Stress-Strain Tensors

FEM surface stress resolving

Stress Tensor time history assembling

Multiaxial Racetrack Filter

Biaxiality ratio

Multiaxial Fatigue Proportional and Non-Proportional Loadings

Elastic-Plastic stress tensors calculation in Proportional loading conditions

Dowling method

Hoffmann-Seeger method

Impact of biaxiaity ratio on fatigue results

Elastic-Plastic stress tensors calculation in Non-proportional loading conditions

Socie pseudo-material method

Ciclic Plasticity Models

Mroz-Garud model

Proportional Loading reduction

Multiaxial HCF methods

Critical plane methods

Other methods

Example: Dang-Van method

Multiaxial LCF methods

Critical Plane Fatigue parameters

Smith-Watson-Topper

Brown-Miller

Fatemi-Socie