

REGRESSION ANALYSIS OF FATIGUE DATA WITH RIGHT CENSORING
BASED ON A MODEL WITH NONCONSTANT VARIANCE AND A FATIGUE LIMIT PARAMETER

by

F.G. Pascual and William Q. Meeker
Iowa State University

Abstract

The fatigue-limit model suggests that specimens tested below a particular fatigue-limit level of stress will never fail. This paper uses maximum likelihood methods to fit a model combining the use of a fatigue limit and nonconstant variance. The model is used to describe the variability and stress dependence in a low-cycle fatigue data set. Modern methods based on likelihood ratio statistics are used to compute confidence intervals for the fatigue limit parameter. Also, by analyzing simulated data sets based on the proposed model, we study the effect that test length has on estimation.