



ΚΥΚΛΟΣ ΣΕΜΙΝΑΡΙΩΝ ΣΤΑΤΙΣΤΙΚΗΣ ΟΚΤΩΒΡΙΟΣ – ΔΕΚΕΜΒΡΙΟΣ 2014

Maria Kateri

*Institute of Statistics,
RWTH Aachen University*

Tampered Failure Rate Step-Stress Models: Continuous vs. Interval Monitoring

ΤΡΙΤΗ 11/11/2014
13:15 – 14:15

**ΑΙΘΟΥΣΑ 607, 6^{ος} ΟΡΟΦΟΣ,
ΚΤΙΡΙΟ ΜΕΤΑΠΤΥΧΙΑΚΩΝ ΣΠΟΥΔΩΝ
(ΕΥΕΛΠΙΔΩΝ & ΛΕΥΚΑΔΟΣ)**

ΠΕΡΙΛΗΨΗ (ΣΤΑ ΑΓΓΛΙΚΑ)

Step-stress models are special accelerated life testing models and are usually considered under the cumulative exposure assumption and for continuous monitoring of the tested units lifetime. In this case, explicit expressions for maximum likelihood estimators of parameters and their conditional density functions, given their existence, are possible only for exponential lifetimes. A step-stress model is constructed that considers a general scale family of distributions, which allows for flexible modeling. It is based on a failure rate approach and leads to explicit expressions for parameters' maximum likelihood estimators and their conditional density functions, for underlying lifetime distributions out of this family. The approach is considered for Type-I and Type-II censored experiments. Furthermore, it is dealt with experiments for which a continuous monitoring of the tested items is infeasible and only their inspection at particular time points is possible. The available information is then the number of failures in specific time intervals and the scheme is known as interval censoring. The existing literature on interval censoring is not as rich as for the continuous monitoring set-up. The model discussed above is extended for an interval censoring scheme that allows for more intermediate inspection points than the stress level change points and the associated inference for Type-I censored data is developed. Results under interval censoring are illustrated and compared to those derived under the corresponding continuous monitoring set-up in terms of characteristic examples.



AUEB STATISTICS SEMINAR SERIES OCTOBER– DECEMBER 2014

Maria Kateri

*Institute of Statistics,
RWTH Aachen University*

Tampered Failure Rate Step-Stress Models: Continuous vs. Interval Monitoring

Tuesday 11/11/2014
13:15 – 14:15

**ROOM 607, 6th FLOOR,
POSTGRADUATE STUDIES BUILDING
(EVELPIDON & LEFKADOS)**

ABSTRACT

Step-stress models are special accelerated life testing models and are usually considered under the cumulative exposure assumption and for continuous monitoring of the tested units lifetime. In this case, explicit expressions for maximum likelihood estimators of parameters and their conditional density functions, given their existence, are possible only for exponential lifetimes. A step-stress model is constructed that considers a general scale family of distributions, which allows for flexible modeling. It is based on a failure rate approach and leads to explicit expressions for parameters' maximum likelihood estimators and their conditional density functions, for underlying lifetime distributions out of this family. The approach is considered for Type-I and Type-II censored experiments. Furthermore, it is dealt with experiments for which a continuous monitoring of the tested items is infeasible and only their inspection at particular time points is possible. The available information is then the number of failures in specific time intervals and the scheme is known as interval censoring. The existing literature on interval censoring is not as rich as for the continuous monitoring set-up. The model discussed above is extended for an interval censoring scheme that allows for more intermediate inspection points than the stress level change points and the associated inference for Type-I censored data is developed. Results under interval censoring are illustrated and compared to those derived under the corresponding continuous monitoring set-up in terms of characteristic examples.

