Multivariate log generalized Birnbaum-Saunders regression models for metal forming processes

Carolina Marchant*
Universidade Federal de Pernambuco, Recife, Brazil - cimfl@de.ufpe.br

Victor Leiva
Universidad Adolfo Ibáñez, Viña del Mar, Chile - victorleivasanchez@gmail.com

Francisco José A. Cysneiros
Universidade Federal de Pernambuco, Recife, Brazil - cysneiros@de.ufpe.br

Univariate Birnbaum-Saunders models have been widely studied and applied to fatigue studies and reliability analysis. We derive a new methodology based on multivariate generalized Birnbaum-Saunders regression models. We use the maximum likelihood method and the EM algorithm for estimating the model parameters. We apply the methodology analyzing a real-world multivariate fatigue data set, which results could allow engineers of materials to schedule tool changing times in metal forming processes and to evaluate tool costs.

Keywords: EM algorithm, logarithmic distributions, maximum likelihood method, multivariate Birnbaum-Saunders distributions.