



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

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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.