ACTIVE DOE[©] EXTENSION: DOE AUTOMATION TOOL FOR MULTIDISCIPLINARY ROBUST DESIGN OPTIMIZATION USING STOCHASTIC ANALYSIS

[1]Malik Kayupov[*],[2]Ravi Nimbalkar, [2]Onkar Mande, [2]Joshua Sims, [2]Santosh Patil
[1]DS SIMULIA, USA
[2]BETA CAE Systems USA Inc., USA

KEYWORDS –
Optimization, Robust design, Stochastic analysis, Automation

ABSTRACT –
A new software extension, **Active DOE** [©], in the software palette of BETA CAE Systems will be presented. Active DOE is a tool based on the initial collaboration between BETA CAE Systems USA and SIMULIA for the benefit of Fiat Chrysler Automobiles. The objective was to come up with a software solution for automating the stochastic and robust design optimization process. The DOE automation process developed helps engineers enhance their current workflow related to the multidisciplinary robust design optimization using GUI driven standardized process. The entire process is integrated in the ANSA environment with ANSA common model as a single source of truth. The tool allows users to interactively select the parts to include in the study and setup the design variables for optimization. The template driven process allows selection of prebuilt load cases and responses, response surface generation, approximation model building, robustness evaluation, and robustness optimization. The post processing functionality provides options to run the validation runs of the optimal designs, overlaying results of different designs, and generating detailed PowerPoint reports. The tool in its current release has the prebuilt load cases for Safety simulations using Isight as the optimization software. The future releases will have other discipline load cases to select as well as other optimization options. Finally, the tangible benefits of the new DOE automation process in terms of huge time savings, elimination of user errors, and streamlining the steps of the entire process will be shown, as well as a brief look at what will follow as future developments.