

# **Modeling Variation Propagation of Multi-Station Assembly Systems With Compliant Parts**

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Products made of compliant sheet metals are widely used in automotive, aerospace, appliance and electronics industries. One of the most important challenges for the assembly process with compliant parts is dimensional quality, which affects product functionality and performance. This paper develops a methodology to evaluate the dimensional variation propagation in a multi-station compliant assembly system based on linear mechanics and a state space representation. Three sources of variation: part variation, fixture variation and welding gun variation are analyzed. The proposed method is illustrated through a case study on an automotive body assembly process.