A Multi-Scale Meshfree Approach for Predicting Wrinkling and its Experimental Verification

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Abstract

Enrichment methods, which allow local or global behavior to be combined with a global approximation to enhance the accuracy, are widely discussed in finite element and meshfree methods. In this work, an adaptive meshfree enrichment method is developed to capture the onset of wrinkling and its post-buckling behavior in sheet metal forming. The buckling mode, obtained from the analytical wrinkling prediction, is enriched into the meshfree continuum formulation by adaptively inserting and deleting enrichment particles during the simulation. Shape functions in the enrichment direction are reconstructed to satisfy the consistency conditions. Numerical solutions are compared with the analytical and experimental results to illustrate the reliability and robustness of the proposed method.

Reference:

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