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Prediction of cutting forces and instantaneous tool deflection in micro end milling by considering tool run-out

Xuwei Zhang , Tianbiao Yu , Wanshan Wang

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## Highlights

- Influence of tool run-out (axial and tilt offset), tooth trajectory, variable entry and exit angles, and size effect on cutting forces in the micro end milling process is evaluated.
- Instantaneous tool deflections are determined based on the distributed load acting on the cutting edge and the tool is assumed to be the continuous Timoshenko beam
- The tool run-out parameters and cutting forces coefficients are calibrated by the measured cutting forces.
- Simulation and experiment results show a good agreement to validate the proposed tool deflection model.

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