
# Characterization of Lubrication Sensitivity on Dynamic Stability in High-Speed Micromilling of Ti-6Al-4V via a Novel Numerical Scheme

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## Highlights

- Three distinct operational regimes are found in high-speed micromilling of Ti6Al4V: lubrication sensitive, insensitive and the transition regimes.
- A significant reduction in cutting forces is observed in the lubrication sensitive regime.
- A 2-DOF stability model with the velocity-chip load dependent coefficients yields a transcendental equation with no closed-form solution.
- Development of a novel numerical scheme based on Newton-Raphson method to determine the stability limits.
- A significant enhancement in the stability limits in lubricated machining beyond the transition regime.