

ULTRASONIC LEADING EDGE FOR LUNAR EXCAVATION TOOLS

E. T. Rezich¹, A. Schepelmann¹, D. J. Gotti², D. L. Linne¹

¹NASA Glenn Research Center

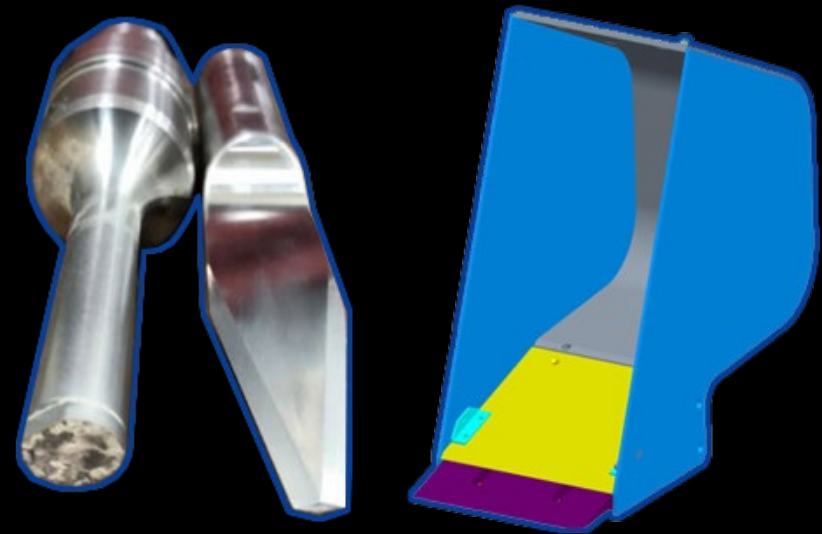
²Universities Space Research Association



Heavy construction and excavation machinery.

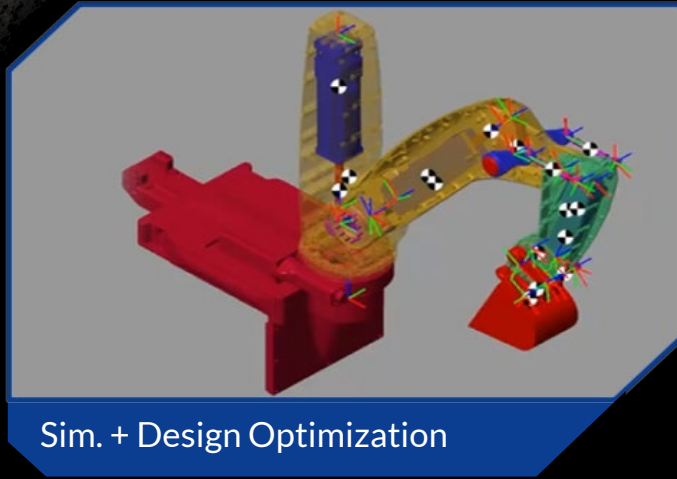
- Tools with resonantly vibrating leading edges could significantly reduce soil penetration forces.
- Such tools could decrease the power consumption and mass of lunar excavation systems.

- Regolith and granular ice excavation is critical to produce resources on the lunar surface.
- Current terrestrial excavation equipment designs are not suitable for lunar applications.

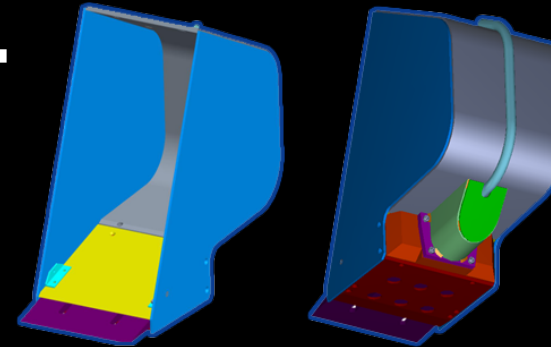


Ultrasonic forced vibration tools. L: Vibration probe. R: Bucket concept.

ULTRASONIC LEADING EDGE TOOL DESIGN PIPELINE



Subscale Component Testing in Vacuum



Full Scale Component Testing in Vacuum



Hardware Testing