

Analysis of Screw shaped bodies in granular media

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Research Question

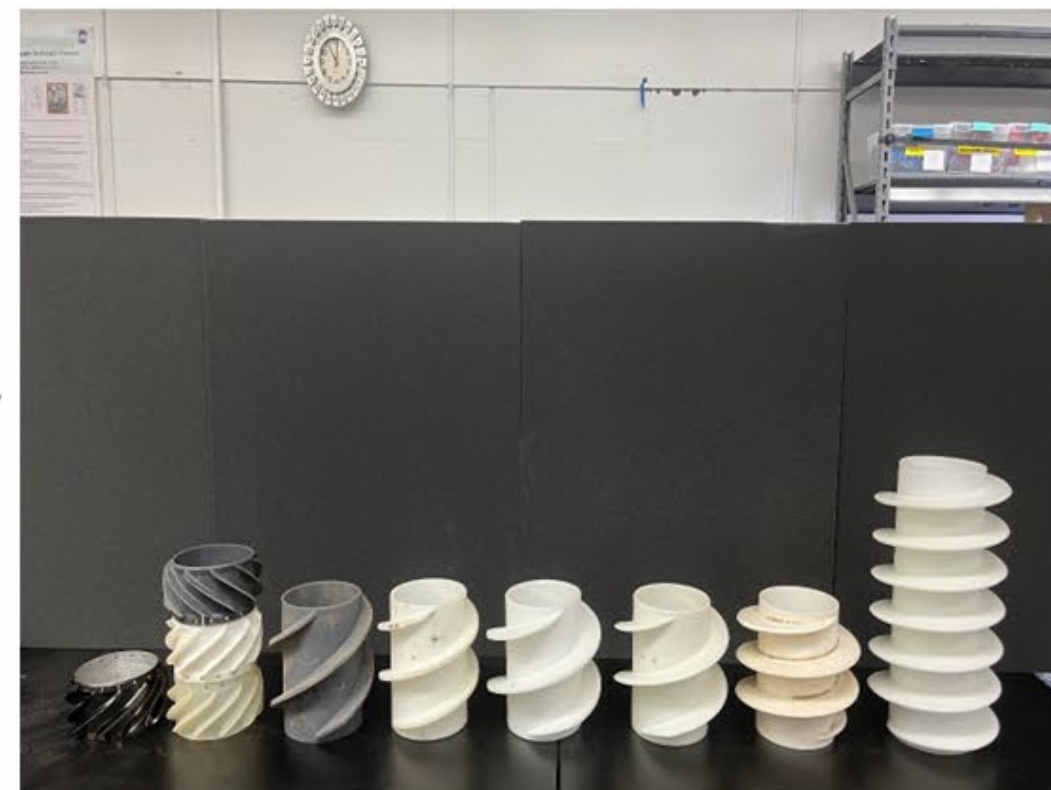
Identifying the Key Computational Parameters for Predicting Screw-Shaped Body Performance in Granular Media, as Corroborated by JPL Experimental Data.



Exobiology Extant Life Surveyor

Background & Motivation

Exploring screw designs for rovers to overcome the challenges of traditional wheels on low-gravity, granular surfaces. This study paves the way for improved extraterrestrial navigation.



Screw Shaped Structures for Rover

Obstacles faced/overcome

Refining simulation accuracy through extensive debugging and in-depth documentation review

Research Methodology

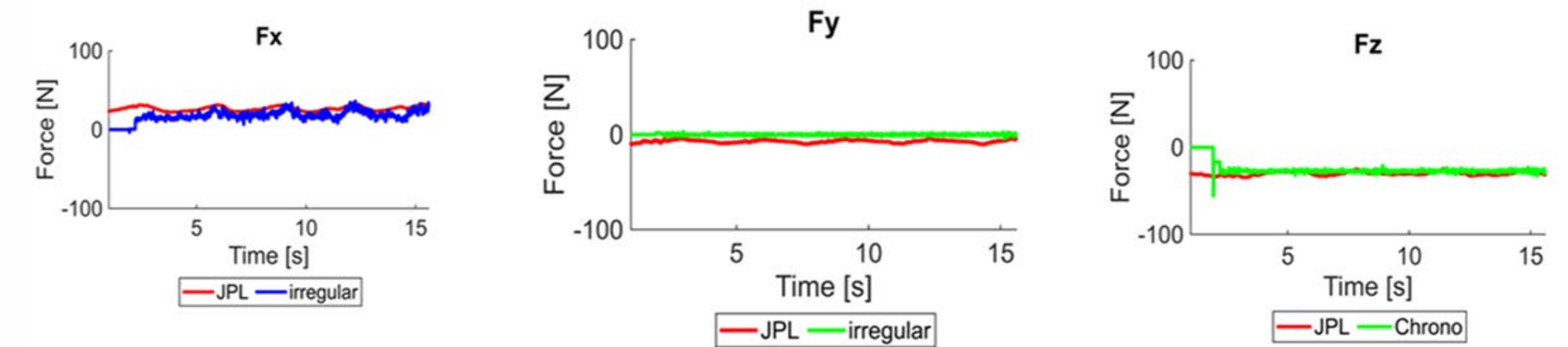
Utilizing DEM-Engine in Project-Chrono to simulate screw shaped bodies in granular media.



Simulating Screw shaped body in granular media

Findings and progress

Adjusted parameters yielded results aligning closely with JPL data, further refined by considering particle shape and size.



Comparing the results of Chrono Simulations and JPL Experiments

Future Works

Future work will diversify granular media with various shapes, including cubes and particles with a normal distribution. Additionally, we plan to implement MBD-DEM simulations for enhanced accuracy.

Acknowledgement

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