

Longitudinal Ridges in Two Lunar Long Runout Landslides, the Apollo 17 Light Mantle Avalanche and the Tsiolkovskiy Crater landslide: Linking Morphological Features to Landslide Dynamics.

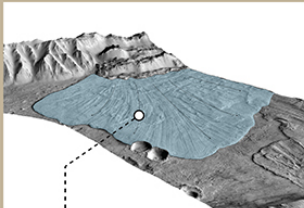
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CONTEXT

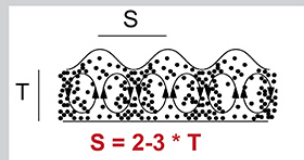
LONG RUNOUT LANDSLIDES are HYPERMOBILE types of landslides, which behaviour is not fully understood.



We focus on the presence of **LONGITUDINAL RIDGES** in order to link the morphology of the landslide deposit to the mechanism involved during emplacement.

MOTIVATION

In ice-free laboratory experiments on rapid granular flow, a **SCALING RELATIONSHIP** between the **WAVELENGTH OF THE RIDGES (S)** and the **THICKNESS OF THE FLOW (T)** was found.



S = 2-3 * T

This suggests that **ICE IS NOT A NECESSARY CONDITION** for the development of longitudinal ridges, which rather form from a **MECHANICAL INSTABILITY WITHIN THE FLOW**.

CONCLUSIONS

- 1) The **SCALING RELATIONSHIP** between the **WAVELENGTH OF THE RIDGES (S)** and the **THICKNESS OF THE FLOW (T)** recurs in nature (==> PLOT 1).
- 2) **LONGITUDINAL RIDGES ARE NOT EVIDENCE OF THE PRESENCE OF ICE.**
- 3) This **SCALING RELATIONSHIP** can be used to **ESTIMATE THE THICKNESS OF LANDSLIDE DEPOSIT** (==> PLOT 2).

