Review of: "Ballistic Motion of Dust Particles in the "Collecting the Big Muley Lunar Rock" Sequence of the Apollo XVI Footage"

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The authors performed a study of the motion of dust in an Apollo XVI footage. The mathematical analysis of the images is simple, but quite rigorous and efficient. After the traditional, long-way approach, I wonder if this could be done using a more automatized software, able to infer the dimensions all over the field of view, independently of lens deformation issues. Such software could analyze the images frame to frame and identify movement, measuring directly the objects along the footage.

Perhaps the authors could write a code using machine learning. From the starting measurements, this could be applied to other footages. In addition, it could transform from each pixel to the real world independently of the deformation, and the peculiar perspective (as the image resolution is poor). As a first approach, your study is fine for the central footage, but measuring things at the borders could be risky.

There is a lot of recent work that allows the creation of accurate models to deal with imagery for scientific use. For example, we are now applying machine learning for reducing the time of astrometric reduction and other routinary tasks, to be able to transform pixel coordinates to the real world (see e.g., Peña-Asensio et al., 2023).

In general, this study of Apollo's footage is an original, quite curious example of simple physics applied to the Moon, and it deserves to be published in Qeios.

Peña-Asensio E. et al. (2023) Deep machine learning for meteor monitoring: advances with transfer learning and gradient-weighted class activation mapping, Planetary & Space Science 238, https://doi.org/10.1016/j.pss.2023.105802.