

Engineers consider how to collect dust from low-gravity surfaces

April 6 2016



Credit: Added Value Solutions

Analysing the dusty layers of low-gravity moons or asteroids using robots is on the agenda for ESA's exploration of the Solar System. Engineers are thinking of ways to collect and analyse the surface dust on far-away worlds. This is particularly tricky in low gravity, because a simple drill or scoop would just push the lander away from the surface.

This [prototype model](#) uses three rotating brushes that also circle in the horizontal plane to scoop dust into a container for analysis. It is designed to collect at least 100 g within 20 seconds.

Designed and built by Added Value Solutions of Spain, the machine automatically detects the distance between the brushes and the surface to adapt as necessary, collect the dust, and direct it into a hermetically sealed box for storage and analysis.

Everything looks promising on Earth, but will it work without gravity? To check it in action, the prototype will fly on ESA's 64th [parabolic aircraft campaign](#) later this month, providing more than 90 bursts of microgravity lasting 20 seconds at a time.

Over the course of three days it will scoop up particles ranging from a few 0.001 mm up to pebbles of 3 cm. The samples can be analysed at the end of each day, and a camera will record progress so that the operators can adjust settings between the bouts of weightlessness.

By running the prototype on a parabolic flight, engineers can fine-tune key factors such as speed, brush depth and sampling duration.

Provided by European Space Agency

Citation: Engineers consider how to collect dust from low-gravity surfaces (2016, April 6)
retrieved 30 January 2023 from <https://phys.org/news/2016-04-low-gravity-surfaces.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.