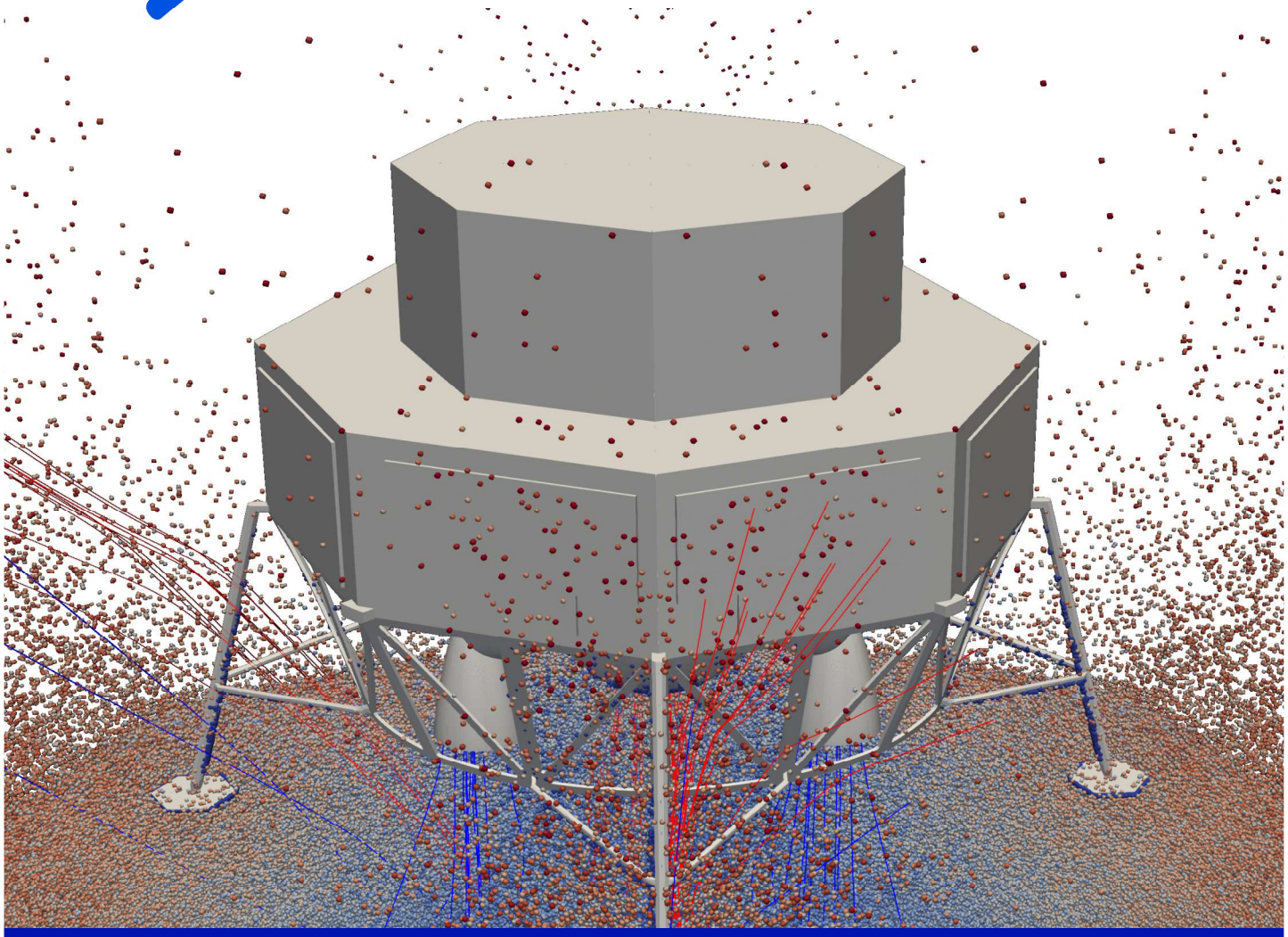
MOONDUST

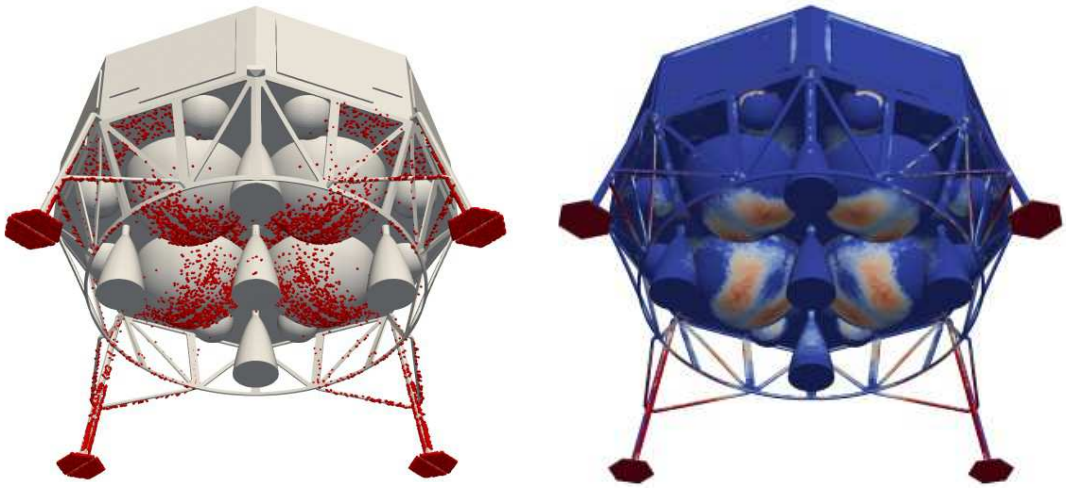


Simulate Lunar Dust Contamination

CIM LAB BY CIM-MES

How MoonDUST works?

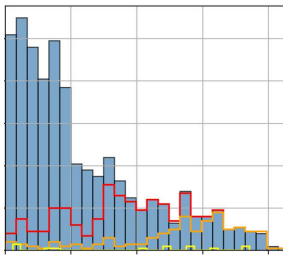
Lagrange approach for large particles + **Euler** approach for smaller particles



Key features

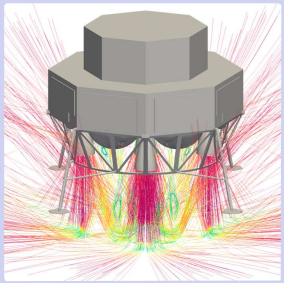
1. Estimate surface contamination

MoonDUST predicts particulate contamination on lunar lander surfaces caused by plume–regolith interaction during descent. It computes particle trajectories from plume flow simulations and provides estimates of contamination levels and potential surface damage from high-velocity regolith impacts.



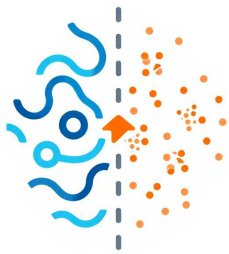
2. Modelling key physics

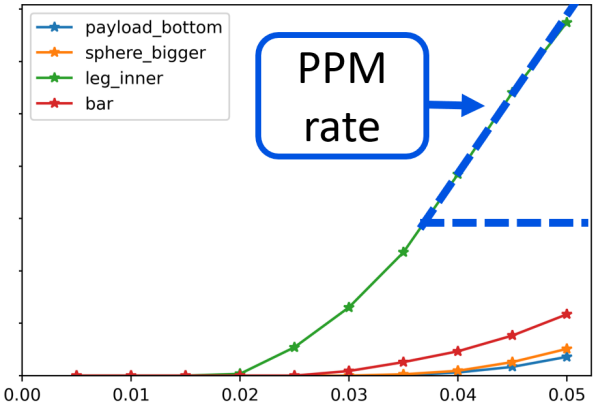
MoonDUST covers the key physics driving plume-regolith interaction. It accounts for electrostatic forces acting on dust, particle–particle collisions, and regolith erosion caused by plume impingement. It also models detailed particle–surface interactions essential for contamination prediction.



3. Supporting your team were you need

Simulations often require CFD expertise, which is typically beyond the scope of contamination teams. MoonDUST allows these two phases to be decoupled — CFD can be prepared independently (by us or another group), while your team can focus on the particle transport analysis.





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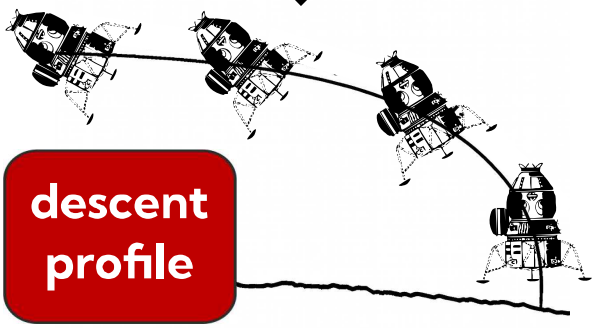
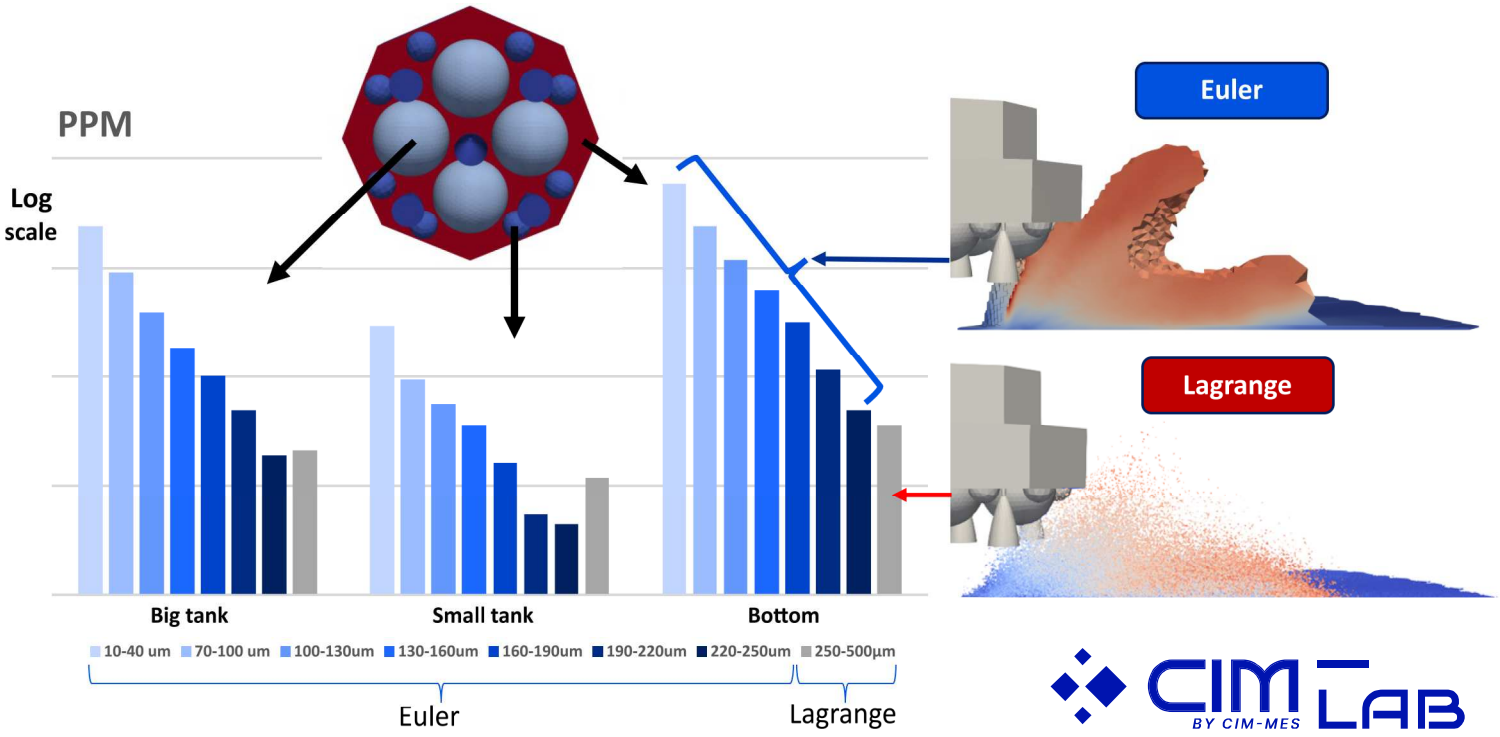


descent profile

Estimate surface contamination (on the lander and surroundings)

Make informed decisions supported by physics-based modelling

- **Combined** Euleran and Lagrangian approach
- Account for **vibration** based release and **electrostatics**
- **Optimised** contamination control
- **Decoupled** flow and particle simulation
- Stand alone **software** or combined with **consultancy**



CIM LAB BY CIM-MES

Who we are?

We are a research and engineering partner, combining design expertise with advanced simulation methods (FEM, CFD, and multiphysics). **CIM-lab**, a division of CIM-mes, develops innovative modelling techniques and engineering software for space applications. In cooperation with **ESA**, we have created software tools — **DUSTFLOW**, **MoonDUST**, and **TEDMAP 3D** — supporting contamination and thermal analyses in space projects.

How we work?

1. Free consultancy session
2. Offer, schedule and scope
3. Execution and intermediate checks
4. Joint optimisation and revisions
5. Report, documentation and follow up

> CIM-mes provides valuable support and the necessary calculations in a very short time, which repeatedly accelerates our work and design decisions. We value working with them – it is substantive, fast and predictable at every stage.
>
> **Filip Ljubas**
> Lead Engineer in **Kelvion**

Among the others, we were trusted by

WÄRTSILÄ · esa · AVIO · BLUE ORIGIN · WEIZMANN INSTITUTE OF SCIENCE · Kelvion

Ready for the next step? Contact us, and we will help define the scope of work and align with your project requirements.

CIM LAB BY CIM-MES

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You whish to discuss your project?

Schedule a free technical consultation with our engineer.

Scan the QR code to book a slot.