PEDAS 2024

Updates!

45th Cospar Assembly

Panel on Potentially Environmentally Detrimental Activities in Space (PEDAS)

PEDAS 2024

UPDATES!

45TH COSPAR SCIENTIFIC ASSEMBLY

10 Solicited Speakers

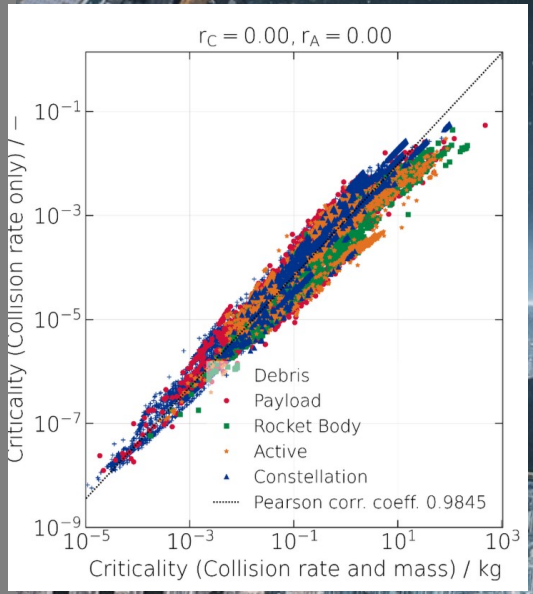
- 1 in Session 1 “Detection, Tracking, Orbit Determination”
- 1 in Session 4 “Astrodynamics for SSA and End-of-Life”
- 2 in Session 7 “Next Steps in Mitigation and Coordination for Space Sustainability”
- 2 in Session 8 “Socio-Economic and Ethical Effects of Space Debris and Zero-Debris for Space Fairing”
- 2 in Session 9 “Near-Earth Space, Object Characterization, Re-entry and Pollution”
- 2 in Session 10 “Socio-Economic Effects of Space Fairing and Space Debris”

2 Invited Short Courses

- Tim Flohrer, *A guide to ESA Tools Supporting the Assessment of Compliance with Space Debris Mitigation Guidelines and Regulation*
- Thomas Schildknecht, *Optical Observations: Detection, Tracking & Characterization of Known and Unknown Human-Made Space Objects*

PEDAS: Clean Space and End-of-Life

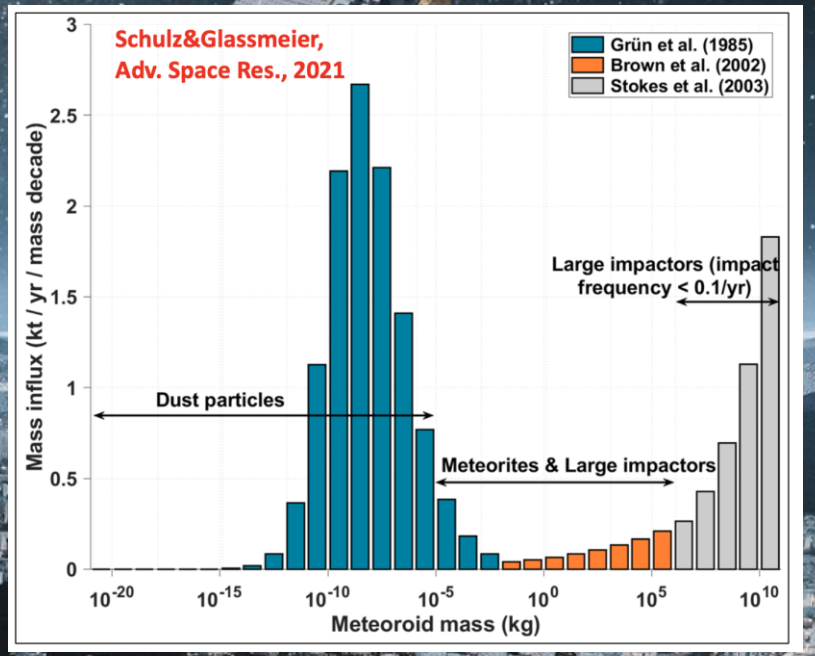
- Criticality metric for space object density *(Böttcher)*
- Debris Growth rates *(Nayyer), d*ebris sources and sinks *(Brownhall)*
- Percolation theory for population models *(Vasile)*
- Sequential removal optimization *(Kravchenko)*



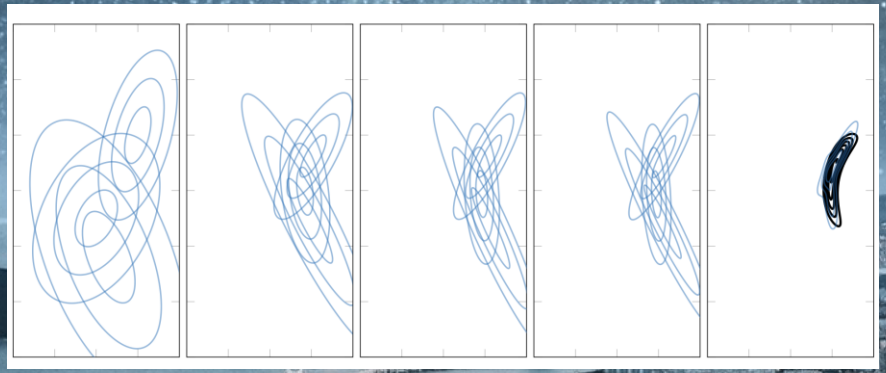
source: Böttcher

PEDAS: Reentry and Constellations

- Effects on the upper atmosphere by higher numbers of reentering debris (Glaßmeier).
- Effects of constellations in orbit (Anselmo) and on reentry (Pardini)



PEDAS: Cislunar

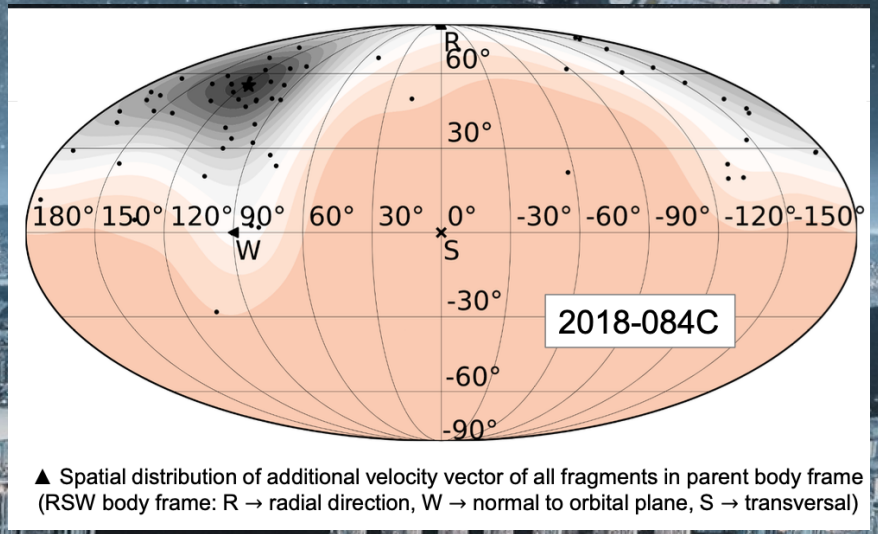


source: DeMars

- Homotopic Bayesian Inference for tracking near-Earth and cislunar (DeMars)
- Effects of cislunar fragmentations on near-Earth and cislunar space sustainability.

PEDAS: Fragmentations

- H-IIA 202 fairing fragmentation root causes (Wacker, Wiedemann)
- AI-driven small debris on-situ detection (Lieu)

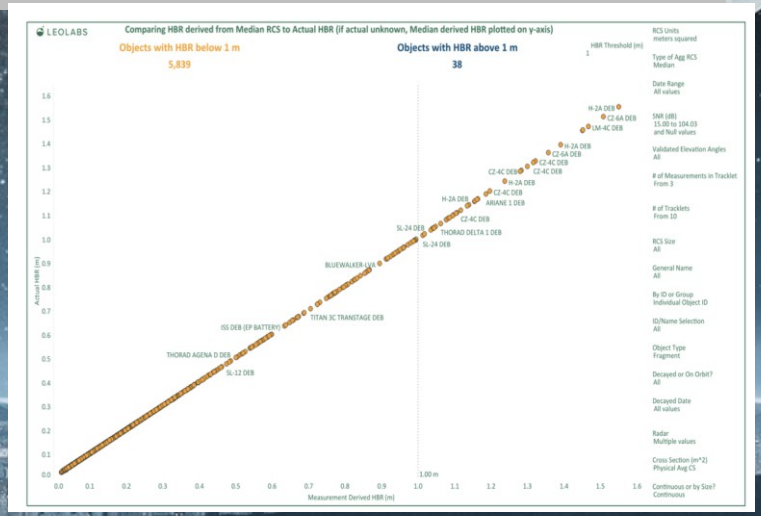


▲ Spatial distribution of additional velocity vector of all fragments in parent body frame (RSW body frame: R → radial direction, W → normal to orbital plane, S → transversal)

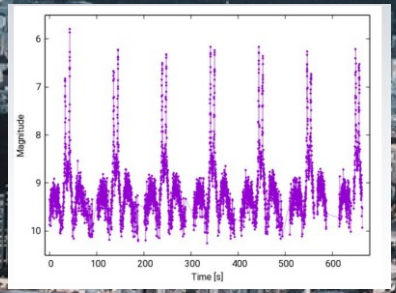
source: Wacker

PEDAS: Characterization

- Servicing via lab experiments (Huwald)
- Reliable radar cross section estimation (McKnight)
- Light curves:
  - Classification via AI (Qhashuo)
  - Attitude evolutions using large datasets, e.g. for the H2A Rocket (Schildknecht)



source:McKnight



source: Schildknecht

PEDAS: Policy and Recommendations

- Cost and compensation of space debris for policy (Lee).
- Liability Compensation
- Service market space (Reed)

PEDAS: Subscribe to Email list!