Universität Stuttgart
IKMT

Master thesis

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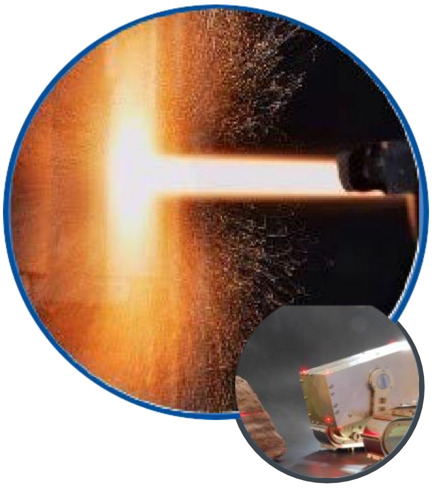

Suspension Thermal Spraying of Lunar Dust Simulant for Passive Adhesion Mitigation

Motivation:

With renewed interest in lunar surface exploration, addressing lunar dust adhesion remains a critical challenge to ensure the durability of lunar mission instruments. For devices with limited energy resources, passive mitigation strategies that do not depend on external power sources are particularly valuable. As part of a collaborative effort between the Institute for Space Systems (IRS) and the Institute for Ceramic Materials and Technologies (IKMT), passive mitigation methods that target electrostatic adhesion forces are investigated. Within the scope of the study, mitigation strategies that reduce the work function difference between lunar dust and substrates are examined. In this research, thermal spraying techniques with suspension are employed to achieve a work function-matching coating. Both Suspension Plasma Spraying (SPS) and Suspension- High Velocity Oxy-Fuel (S-HVOF) are assessed, and the resulting coatings are compared.

Tasks:

- Literature review on suspension thermal spraying technologies;
- Understanding of Lunar dust issues and relative adhesion forces;
- Development of the thermally sprayed coatings;
- Material analysis of the samples
- Testing and verification;
- Evaluation and Documentation.

Disciplines:
Aerospace, Material Science or equivalent.

Start: Available as of now

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