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Electro-tribological tests offered by AAC

A slipring (in electrical engineering terms) is a method of making an electrical connection through a rotating assembly. Sliprings, also called rotary electrical interfaces, rotating electrical connectors, collectors, swivels, or electrical rotary joints, are commonly found in all rotary systems with electrical connections of sensors and receptors.

Sliprings in space environment need to withstand harsh environment without the opportunity to do any service once the satellite is launched. Testing on component level reduces the costs and opens more detailed analysis compared to tests on fully assembled slipring devices.

One ring with up to 4 brushes can be tested from ambient environment to thermal vacuum. Friction- and load force for each brush is measured. The voltage drop on the slipring and the transferred current are measured with an accuracy and speed so that micro interruptions of down to 1ms can be detected. Post-test analysis of ring and brushes with SEM / EDX shows the wear and it's mechanism. Different movement and thermal profiles can be done to simulate lifecycles of space-missions.

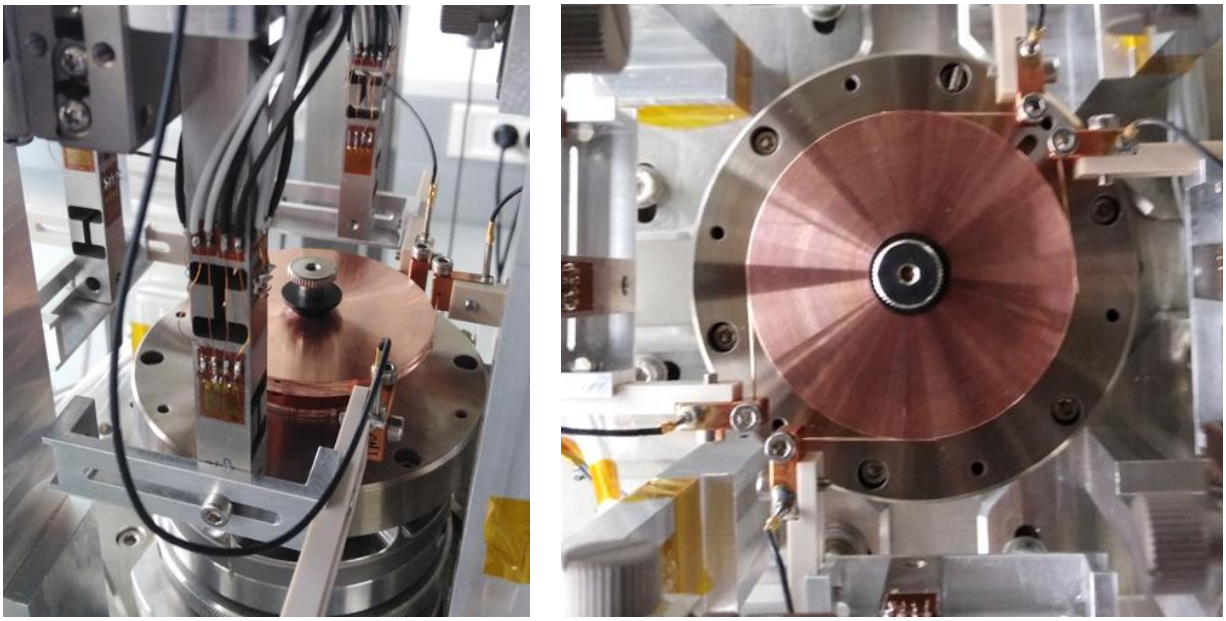

Figure 1: Setup of Slipring test-device

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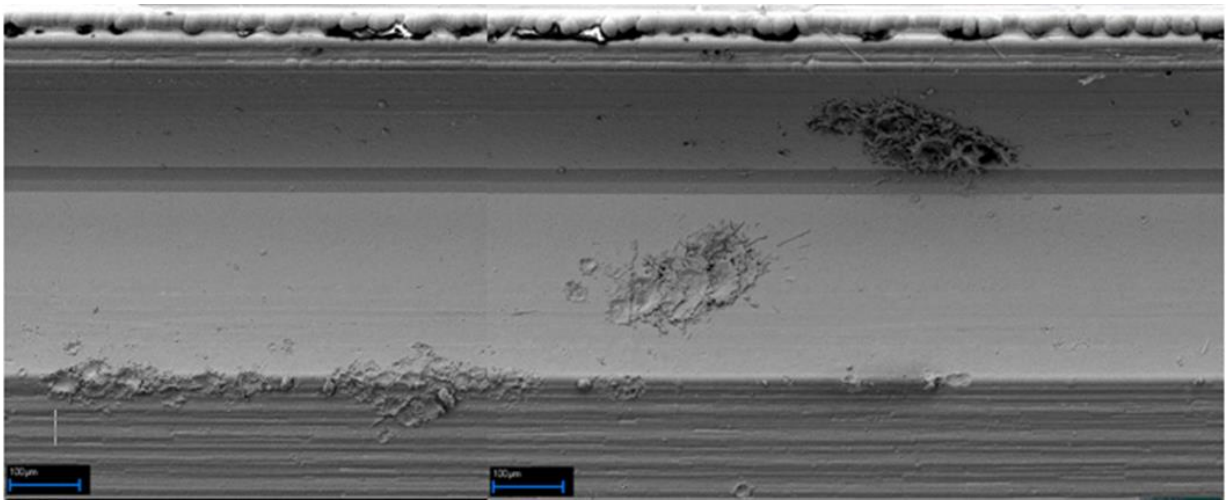

Figure 2: Post-test analysis of a slipring (arcing)

The setup can be adapted to take up potentiometers or different kinds of sliprings. Additional measurements like temperature of brush with IR camera even in vacuum, arcing, stress relaxation of preload in thermal environment are available. Beside standardized tests, AAC aims to adapt the test method and test setup as close as possible to your needs.

Slipring testing	
Sample geometry	1 slipring/potentiometer (Ø 24mm – 60mm) with 2 – 4 brushes (length 20mm – 50mm)
Vacuum	P < 10^{-5} mbar
Temperatures	Room temperature up to 100°C
environment	Air, vacuum, gases
Accuracy	Load / friction forces of brush: ±2mN Current: ±1mA Voltage: ±5mV
Results	Resistance, friction force per brush, load force per brush, voltage drop, current, temperature over duration / time / environment

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