

Session 9 Summary

In session 9 Lunar Laser Ranging and Deep Space Missions we had a total of 6 presentations and 1 poster.

The 6 presentations were focused as follows:

J. Eckl et al. reported on how the Wettzell SLR station realized ranging to earthbound satellites and the lunar retroreflectors in both green and infrared wavelengths with the same system while being eyesafe.

Y. Xiong et al. reported about the setup of the Yunnan SLR station setup that is ranging to the lunar reflectors since 2018 while using a 1.2 m telescope.

Y. He et al. presented a new hollow Laser Retro Reflector Design that is to allow for a ranging precision of a few millimeters. The reflector was launched with Change 4 (Queqiao) and shall be tested over a distance of 450000 km while the spacecraft will orbit the lunar L2.

L. Porcelli et al. reported about the status of the INFN Laser Retro Reflector Qualification and its thermal and optical behavior. Further they showed the status of the incorporation of the Reflector to the TeamIndus and the MoonExpress-1 mission, which it will be flying on.

V. Zharov reported about a new station in the Caucasian mountains that is supposed to do Lunar Laser Ranging. Aiming for more accurate and precise measurements, the author presented how this would also allow for a more accurate Lunar Reference Frame, a basis for future lunar exploration.

S. Turyshev reported about a new CW infrared laser system at the Table Mountain Observatory that is supposed to deliver many more photons than regular pulsed systems due to its high power (1.1 KW). With that, differenced measurements from multiple mirrors shall allow for better analysis of the lunar interior. Further, such an improved performance would allow for lightweight reflective tape instead of Retro Reflectors onboard of satellites.

Overall effort in more countries can be seen doing, upgrading or erecting stations for lunar laser ranging. China has planned some larger steps for doing lunar laser ranging including an adequate station, retro Reflector as well as dedicated experiments. A very novel approach was brought in by S. Turyshev et al., who proposed to derive range measurements from a KW CW laser. Let's see how that works out, but the idea has quite some potential.

While there is a lot of lunar laser ranging activity, there are currently no deep space activities.

We thank all presenters for their participation in session 9 Lunar Laser Ranging and Deep Space Missions.

The chairs

Sven Bauer

Jean Marie Torre