

High Repetition-Rate Systems Session Summary

Chairs: Georg Kirchner, Jan McGarry

The number of high repetition rate SLR systems continues to increase with each Workshop. The kHz “club” started operationally with the Graz station which has now five years of continuous 2 kHz operations with excellent results including high reliability and stability. Herstmonceux is moving into operations with a laser similar to that at Graz and NGSLR expects to be operational with their eyesafe 2 kHz laser in 2009. Potsdam has a 2 kHz control system ready and expects their laser in 2009.

China is working toward 1 kHz for all five of their stations, with the control system and Event Timer tested, and the first laser expected soon.

Russia now has a station at 300 Hz with data delivery just started.

Zimmerwald is getting excellent results operationally with their 100 Hz laser, and TIGO’s operation, also at 100 Hz, is showing increasing results.

This session showed that high repetition rate systems provide the ability to do several things that lower rate systems are not well suited for. These include the ability to do eyesafe laser ranging with a much reduced energy level as is shown with the NGSLR system whose laser currently outputs less than 100 microJoules. The higher rate systems can also retrieve the optical response of the retro-reflector arrays when coupled with single photon detection. With the higher return rates from kHz lasers millimeter accuracy is possible from centimeter targets. Other areas that benefit from kHz data are the determination of satellite spin rate as shown from the analysis of the Graz system data, and LIDAR data which can be obtained as a by product of SLR operations.

Not in this session, but other planned uses for high repetition rate SLR are determining atmospheric “seeing” and planetary transponder ranging.