

FIRST RESULTS FROM THE SATELLITE OBSERVING SYSTEM WETTZELL. S.Riepl, A.Böer, R.Dassing, J.Eckl, A.Leidig, S.Mähler, C.Schade, M.Schönberger, Bundesamt für Kartographie und Geodäsie, Geodätisches Observatorium Wettzell, D-93444 Bad Kötzing, Germany, email: stefan.riepl.@bkg.bund.de.

Abstract: The Satellite Observing System Wettzell (SOS-W) is the newly envisaged SLR System at the Wettzell site which is expected to reach operational status within 2014. The innovative bistatic design permits routine two colour operation at kilohertz repetition rates. Due to the relative low pulse energy of kilohertz lasers, transmit pointing and defocus errors are a major obstacle limiting the performance of such SLR systems. In contrast to other pointing correction approaches, which rely on the analysis of laser radiation backscattered within the tropospheric transmission path, the optical design of the SOS-W enables for a system internal - and thus easy to automate - diagnose and compensation mechanism to align the transmit and receive optical axes with respect to each other. This improved alignment allows for the minimization of the receiver field of view below 20 arcseconds reducing both, the achievable daylight noise level as well as the atmospheric backscatter detections at transmit receive time overlaps. Moreover the SLR system features an integrated aircraft safety LIDAR, further easing the requirements for autonomous observation. Besides the continuous monitoring of mount parameters ongoing activities include link budget measurements in conjunction with characterization of the transmit telescope optics. First range measurement results are presented introducing a new type of single photon avalanche diode detector operated at a wavelength of 850nm. The overall system performance enables for observation up to GNSS orbits at elevation angles down to 20 degrees, which is unique for existing kilohertz laser ranging systems.