

DEVELOPMENT OF A HIGH ACCURACY, USER FRIENDLY LUNAR LASER RANGING TELESCOPE STEERING AND POINTING SOFTWARE PACKAGE AT HARTRAO. L. Combrinck, Hartebeesthoek Radio Astronomy Observatory, PO Box 443, Krugersdorp, 1740, South Africa; ludwig@hartrao.ac.za

Introduction: Development of a user friendly, high accuracy steering and pointing programme is an essential component of the Lunar Laser Ranger (LLR) system being constructed at HartRAO in collaboration with NASA (GSFC) and the Observatoire de la Côte d'Azur (OCA) of France. The software source code is being written using C++ on a Windows platform. A small (125 mm) refractor mounted on a robust equatorial mount is being used as a test-bed. This allows easy evaluation to ensure that the code and servo drives perform as required.

Hardware: Two Ingenia Venus digital servo drives that are able to drive motors at 1 kW continuous and 2 kW peak are utilised. These drives are small enough to be used for the test-bed telescope; this approach therefore allows the hardware and software to be migrated to the 1 metre optical telescope to be used for LLR purposes. Differential encoders are used for positional feedback and an RS232 interface (daisy-chained) for communication to the servo drives. We report on the strategy employed, describe inter-programme communication using Dynamic Data Exchange (DDE) for shared memory purposes, and initial results on the test-bed. The final planned configuration of the LLR telescope drive system is outlined. Currently, 0.5 arc-second rms statistical values are achieved on the test-bed telescope.