

NEOexchange: A Target and Observation Manager For NEO Follow-up and Characterization

T. Lister, J. Chatelain, and E. Gomez

Las Cumbres Observatory, 6740 Cortona Drive Suite 102, Goleta, CA, 93110, USA

contact e-mail: *tlister@lco.global*

We have developed web-based software called NEOexchange which automatically downloads and aggregates NEO candidates from the Minor Planet Center's NEO Confirmation Page, the Arecibo and Goldstone radar target lists and the NASA lists. NEOexchange allows the planning and scheduling of observations on the LCO Telescope Network and the tracking of the resulting blocks and generated data. We have extended the NEOexchange software to include automated scheduling and moving object detection, with the results presented to the user via the website. NEOexchange is an operating example of what are now being called Target and Observation Managers (TOMs). Several groups have developed similar project and science area-specific software for follow-up. However TOMs aim to provide generalized follow-up software that will scale to the size of the target lists produced by surveys like ZTF and LSST. In addition, they will provide scheduling, tracking and analysis facilities for the increasingly complex and more time-critical follow-up data on these targets. Recently, we have extended NEOexchange to include a generalized telescope and instrument model to estimate SNR, and applied this to the LCO 2-meter telescopes and FLOYDS low resolution spectrographs. This has enabled the planning and scheduling of spectroscopic observations of asteroids, along with flux standards and other calibration targets, on the LCO Network. We have also developed a characterization page that can analyze all the targets in the database, and provide an optimized target list for the current lunation. These targets can be scheduled on the LCO Network, and LCO is working to part automate the SOAR 4.1m telescope so it can be incorporated into a broader time-domain follow-up network. We are extending NEOexchange to allow co-ordination, planning, scheduling and data analysis of follow-up observations of all types of solar system objects across a wide range of telescopes.