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Recent Evolutions In ESA's NEO Coordination Centre System

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ABSTRACT

The NEO Coordination Centre (NEOCC) is a major element of the Planetary Defence Office of ESA's Space Safety Programme. One of its main goals is the generation, collection, integration and display of computed and existing NEO data in order to provide users with up-to-date information on NEO hazard monitoring. This is done by operating and maintaining a software system interfacing with the users through a technical web portal publicly available at <http://neo.ssa.esa.int>. The NEO System is an evolving environment. Since when it was first established in 2012 its functionalities have been steadily growing in terms of available services and data. A recent significant addition is the incorporation of an accurate orbit determination service as migrated from the well-established NEODyS system. On-going activities are the migrations of the NEODyS impact monitoring service and the EARN database and the incorporation of a FITS archiving facility. This will allow ESA's

Planetary Defence Office to gain a fully integrated, state of the art, orbit determination and impact monitoring system.

The most relevant incorporation in the last period is the one related to the mentioned orbit determination capabilities. This functionality allows to ingest all MPC measurements both for NEOs and non-NEOs, compute a very accurate representation of their orbits, process all updates and verify their accuracy. Furthermore, it provides that information for output purposes in the NEOCC web portal, and allows deriving close approaches data and serve as input for the impact monitoring service to be deployed within 2019 at the NEOCC.

Continuous corrective and evolutionary maintenance ensures the improvement of already existing services such as the risk table, the NEO observation priority list available, displaying animated orbital plots and browsing through a large database of orbital and physical characteristics of the solar system small body population. ESA's NEO System also links up with the Solar System Object Image Search (SSOIS) system developed by the Canadian Astronomy Data Centre. The publication of a monthly newsletter and regularly updating the NEO Chronology addresses a wider audience encompassing the media and the public at large.

A list of future developments includes: finalizing the migration of the NEODyS services, adding new visualization tools, finalizing a fireball information system, implementing an impact effects tool and incorporating the outcome of the European Commission NEOShield-2 project output into the NEO system.
