ScopeSim

A PYTHONIC ASTRONOMICAL INSTRUMENT SIMULATOR

Sombrero galaxy

Cluster of 50 elliptical galaxies

A 1 hour MICADO Ks-band observation of a fictitious region of the sky with ScopeSim, using the MICADO-Sci instrument package from the IRDB and several helper functions from ScopeSim-Templates

ScopeSim is a flexible **general purpose** open-source astronomical **instrument** data **simulation** framework in **Python**.

scopesim.readthedocs.io

Saturn at opposition

10 000 $M_\odot$ cluster

Vesta at conjunction

M101

The ScopeSim framework consists of a series of python packages which work together to enable the user to simulate a **wide variety of astronomical instruments**; from the Viennese 1.5m telescope to MICADO and METIS at the 39m ELT.

The design allows many **different levels of fidelity** to be simulated, depending on the complexity required by the use case. In the MICADO consortium the science team uses ScopeSim for **quick-look feasibility studies**, and the data reduction software uses ScopeSim to generate raw **data for testing the pipeline**.

The ScopeSim framework owes its flexibility to a strict division of responsibilities between packages:

- **Simulation engine:** is completely instrument and target agnostic. A target description and an instrument package are required as input.
- **On-sky target descriptions:** are generated by the ScopeSim templates package. The templates have no knowledge of the optical systems.
- **The Instrument Reference Database:** contains instrument packages which hold the data needed to create digital models of an optical system.

All packages and data in the ScopeSim framework are open source and can be found on GitHub:

Simulation engine:
scopesim.readthedocs.io

On-sky target templates:
scopesim-templates.readthedocs.io

Instrument packages:
github.com/astronomyk/irdb

The code used to generate this poster image:
https://tinyurl.com/y4hn6opl

The associated proceedings paper: 11452-82

MICADO METIS

ScopeSim has been developed at the University of Vienna as part of our contribution towards the development of the MICADO and METIS instruments for the ELT (via HRSM Project: IS538004).

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