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Euclid. I. Overview of the Euclid mission

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Abstract

The current standard model of cosmology successfully describes a variety of measurements, but the nature of its main ingredients, dark matter and dark energy, remains unknown. Euclid is a medium-class mission in the Cosmic Vision 2015-2025 programme of the European Space Agency (ESA) that will provide high-resolution optical imaging, as well as near-infrared imaging and spectroscopy, over about 14,000 deg^2 of extragalactic sky. In addition to accurate weak lensing and clustering measurements that probe structure formation over half of the age of the Universe, its primary probes for cosmology, these exquisite data will enable a wide range of science. This paper provides a high-level overview of the mission, summarising the survey characteristics, the various data-processing steps, and data products. We also highlight the main science objectives and expected performance.

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