

MEMO

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From:	R. Laureijs on behalf of the EST	Visa:	
To:	ESA		
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Subject: Q1: Euclid's first public data release - scope and content

The data release policy and plan for the Euclid nominal mission of 6 years consists of three major data releases (DR1, DR2, and DR3), and 4 minor “quick” releases denoted by Q1, ..., Q4 (Euclid Science Management Plan, version 2.4). The Q releases are meant for the legacy community. The SMP states that “the Q products are suitable for most purposes in astronomy except for the core cosmology objectives of Euclid.” The earliest public release, Q1, shall take place 14 months after the start of the nominal mission and contains the “Level 2” data of one or more sky areas. This memo describes the scope and content of the Q1 release, including the intended purpose, restrictions and conditions. It is written by the Euclid Project Scientist after discussions with the Euclid Science Team members, respecting the SMP instruction (Section 3.1) “The Euclid Science Team oversees the preparations and execution of scientific operations, and endorses distribution of the data products to the community via the ELA”, where ELA is the Euclid Legacy Archive (see the glossary at the end of this memo).

The Q1 data are considered above all as a first showcase of the Euclid data to attract the attention of the general scientific community. The purpose of the Q1 release can be summarised as follows:

- Q1 provides a first set of Euclid data so that non-EC scientists can understand the quality and performance of Euclid already one year before its first data release DR1, which will include the reprocessed Q1 dataset,
- Q1 helps non-EC scientists to gain early familiarity with the Euclid data and archive infrastructure, and with the dedicated facilities and tools developed by ESA and the Euclid Consortium (EC),
- Q1 gives non-EC scientists the opportunity to prepare and tune their own scientific programs that will involve Euclid data, facilitating a prompt scientific return from DR1.
- Q1 marks the start of the scientific exploitation of Euclid nominal mission data by non-EC scientists.

The main component of the Q1 data shall contain Level 2 data of a single visit over the Euclid Deep Fields (EDFs): 20 deg² of the EDF North, 10 deg² of EDF Fornax, and 23 deg² of the EDF South. The deep fields will be visited multiple times during the mission and their detailed specifications have been announced¹ to the scientific community in 2019. These areas are now familiar to astronomers and ancillary data from other observatories are available. The second component of Q1 will be a compilation of other areas on the sky. These fields may also be selected from survey characterisation observations obtained during the commissioning phase. The total accumulated Q1 area shall be of the order of 50 deg².

No later than 4 months before the Q1 release date, the Euclid Science Team (EST) shall provide to the ESA Euclid project scientist recommendations on the selection of fields and on the associated set of Level 2 data products. These recommendations shall be based on: (1) the scientific merit of the fields for legacy science, (2) the timely availability of the observations which are contingent on the start date of the survey and other details in the survey planning, (3) the expected timely availability of the data products, (4) the expected timely validation of the products.

The release includes the explanatory documentation. The final approval shall be given by ESA.

¹ See: <https://sci.esa.int/web/euclid/-/61403-three-dark-fields-for-euclid-deep-survey>

As the survey plan is highly constrained, there is a probability that not all deep field areas can be made available for Q1. If the data of one or more of the EDFs cannot be released then the EST field-selection recommendation shall identify alternative areas with similar size from the available observations, considering the general properties of the EDFs.

The EST recommendations on the sets of Level 2 data products to be released for Q1 shall take into account the maturity of the processing functions and the protection of the Euclid core cosmology. As a minimum, the sets shall include the following Level 2 data products: the astrometrically and photometrically calibrated images obtained from the VIS imaging instrument, the calibrated near-infrared images in the three photometric bands from the NISP instrument, one and two-dimensional near-infrared spectra from NISP, and image mosaics of VIS, NIR and EXT data produced by the MER processing function.

Glossary:

Catalogue data: tabulated properties/parameters of sources detected in the mosaics.

Euclid core cosmology: the research fulfilling the cosmology objectives and top level requirements given in the Euclid Science Requirements document.

ELA: Euclid Legacy Archive which is mentioned in the SMP; during development a comparable system was introduced: the Science Archive System (SAS), which is part of the Euclid Archive System (EAS)

EXT data: complementary data from ground based surveys reprocessed for Euclid purposes.

Image mosaic: areas on the sky where images obtained from the individual survey pointings are merged into pre-defined maps and are resampled on a common grid.

Legacy: research not addressing the core cosmology

NISP instrument: one of the two scientific instruments of Euclid, capable of imaging photometry in three near-infrared bands (Y, J, H), and near-infrared spectroscopy in two infrared wavelength ranges.

Processing function: a self-contained function contributing to the full data processing pipeline. Processing functions VIS, NIR, EXT and MER are mentioned here.

Survey plan: pre-defined sequence of sky pointings for timed observations in a given observing mode.

VIS instrument: one of the two scientific instruments of Euclid, a ~603 Mpix imaging sensor operating in one visual band.