

Rubin LSST-France, CPPM
Marseille, 10-12/06/2024



**Rapport sur les
contributions**

ID de Contribution: 1

Type: **Non spécifié**

Stellar Population Synthesis & templates for photometric redshifts

mercredi 12 juin 2024 14:00 (20 minutes)

I will present the continuation of our work on photometric redshifts using templates derived from observed spectra, extended using Stellar Population Synthesis methods.

The prospects of this work - and potential for improvement - for future studies will be presented and discussed during the talk.

Auteur principal: CHEVALIER, joseph (IJCLab - A2C)

Co-auteurs: COHEN-TANUGI, JOHANN (LUPM, Université de Montpellier); ANSARI, Reza (Université Paris-Saclay & CEA); Dr DAGORET, Sylvie (IJCLab)

Orateur: CHEVALIER, joseph (IJCLab - A2C)

Classification de Session: Science talks

ID de Contribution: 2

Type: **Non spécifié**

Source photo- and morpho-metry with SourceXtractor++ in Euclid ERO data

lundi 10 juin 2024 16:45 (25 minutes)

I will present some results from the Euclid Early Release Observations obtained in the field of the lensing cluster A2390 in order to highlight the merits of model photometry and morphometry using SourceXtractor++ code.

Auteur principal: Dr GAVAZZI, Raphael (LAM CNRS)

Orateur: Dr GAVAZZI, Raphael (LAM CNRS)

Classification de Session: Science talks

ID de Contribution: 3

Type: **Non spécifié**

CCOB Narrow Beam EOTest ghosts analysis for alignment

mercredi 12 juin 2024 11:30 (15 minutes)

I'll present results of the analysis of narrow beam electro-optical tests for the alignment of the camera optics.

Auteur principal: Dr BREGEON, Johan (IN2P3 LSPC)

Orateur: Dr BREGEON, Johan (IN2P3 LSPC)

Classification de Session: Science talks

ID de Contribution: 4

Type: **Non spécifié**

Surrogate M1M3 dynamic tests

mercredi 12 juin 2024 11:15 (15 minutes)

The M1M3 glass mirror is now on site and has been installed on its cell and coated. Before installing the M1M3 glass mirror on the Rubin telescope, we proceeded to confirm the safety of the glass using a surrogate mirror on the telescope mount, and to verify accordance with specifications. Designed to be used for tests, the surrogate has similar mechanical properties as the glass mirror, such as mass, centre of gravity, and geometry.

The M1M3 steel surrogate was installed on the cell and on the telescope mount (TMA) in May 2023. The cell was fully equipped with the force actuators, hardpoints and various monitoring sensors. An extensive dynamic testing campaign took place until February 2024, when the surrogate and cell were dismounted from the TMA for the reception of the M1M3 glass mirror.

The test campaign was configured to validate the safe and dynamic telescope capabilities.

We also checked the position repeatability before and after a slew for different azimuth, elevation and speeds. We also investigated possible M1M3 surrogate vibrations due to the Fan Coil Units (FCU), which could have an impact on image quality.

Analysis was done on data taken during this period with dedicated dynamic tests. However, more data will be needed for the vibration analysis.

Results show that the position repeatability is almost within specifications, and that vibrations due to FCUs can be neglected.

Auteurs principaux: JEREMIE, Andrea (LAPP-CNRS/IN2P3-Univ. de Savoie-Mont-Blanc); BOUTIGNY, Dominique (LAPP)

Orateur: JEREMIE, Andrea (LAPP-CNRS/IN2P3-Univ. de Savoie-Mont-Blanc)

Classification de Session: Science talks

ID de Contribution: 5

Type: **Non spécifié**

Impact of blending on weak lensing measurements with Rubin-LSST

Upcoming deep optical surveys, such as the Vera C. Rubin Observatory Legacy Survey of Space and Time (LSST), will scan the sky to unprecedented depths, detecting billions of galaxies. However, this amount of detections will lead to the apparent superposition of galaxies in the images, a phenomenon known as blending, that can affect the accurate measurement of individual galaxy properties. In particular, galaxy shapes play a crucial role in estimating the masses of large-scale structures, such as galaxy clusters, through weak gravitational lensing.

This talk introduces a new catalog matching algorithm, friendly, designed for detecting and characterizing blends in simulated LSST data for the Dark Energy Science Collaboration (DESC) Data Challenge 2. The aim of this algorithm is to combine several matching procedures, as well as a probabilistic method to quantify blended systems.

By removing the resulted 27% of galaxies affected by blending from the dataset, we demonstrate that the amplitude of the excess surface mass density $\Delta\Sigma$ weak lensing profile —potentially biased low due to blending —may be partially corrected.

Auteur principal: RAMEL, Manon (LPSC / IN2P3)

Orateur: RAMEL, Manon (LPSC / IN2P3)

Classification de Session: Science talks

ID de Contribution: 6

Type: **Non spécifié**

DC2 bright stars masks

mercredi 12 juin 2024 15:00 (20 minutes)

The presence of bright objects, notably stars, represents a significant challenge in extracting valuable insights from LSST data. Bright objects will cause the saturation of LSST's sensors and will bias both object detection and flux measurement in a radius which depends on the magnitude. The creation of masks to cover the most affected regions by bright stars is necessary but challenging due to the difficulty in identifying and characterizing those objects. Our work is based on the HSC-SSP method and is applied to the DC2 object catalog. The resulting masks cover about two percent of the DC2 footprint. The impact of these masks is currently being studied in DESC in the context of galaxy cluster detection algorithms such as AMICO and redMaPPer.

Auteur principal: AMOUROUX, Nathan

Orateur: AMOUROUX, Nathan

Classification de Session: Science talks

ID de Contribution: 7

Type: **Non spécifié**

The DESC cluster weak lensing mass library v2.0

mardi 11 juin 2024 14:45 (20 minutes)

Accurate cluster mass estimates are vital for constraining cosmology with galaxy cluster abundance, one of the primary cosmological probes on LSST. We present here the second version of the Cluster Mass Modeling (CLMM) library, developed for the Dark Energy Science Collaboration (DESC), for calibrating cluster masses based on the weak lensing signal of background galaxies. This library is being developed by a large group of young career scientists with complete documentation and automatic testing, which makes the assumption of the computations transparent and the results reproducible. The new version of CLMM includes the functions for stacking clusters and more flexibility for different formats of photometric redshift inputs besides further implementations on the theoretical modeling and data operations.

Auteur principal: Dr AGUENA, Michel (APC)

Co-auteur: RICCI, Marina

Orateur: Dr AGUENA, Michel (APC)

Classification de Session: Science talks

ID de Contribution: 8

Type: **Non spécifié**

Search for dark matter halos in the milky way with stellar streams detected by the Rubin/LSST observatory

lundi 10 juin 2024 18:15 (15 minutes)

Introduction of the French involvement in the DESC official project aiming at connecting observable properties of stellar streams observed with Rubin/LSST to dark matter constraints. Presentation of the analysis preparation examining the impact of dark matter subhalos with masses ranging from 10^6 to 10^8 solar masses on simulated stellar streams

Auteurs principaux: KUNA, Marine (UGA / LPSC); PELISSIER, Matthieu

Orateur: PELISSIER, Matthieu

Classification de Session: Science talks

ID de Contribution: 9

Type: **Non spécifié**

Search for Orphan GRB Afterglows in Rubin LSST data

mardi 11 juin 2024 14:25 (20 minutes)

Orphan gamma-ray burst afterglows are good candidates to learn more about the GRB physics and progenitors or for the development of multi-messenger analysis with gravitational waves. Our objective is to identify orphan afterglows in Rubin LSST data, by using the characteristic features of their light curves. We present here the performance of our machine learning filter as implemented in the Fink broker and tested on the ELAsTiCC data set and our own simulations of orphan afterglows.

Auteur principal: MASSON, Marina (LPSC)

Orateur: MASSON, Marina (LPSC)

Classification de Session: Science talks

ID de Contribution: **10**

Type: **Non spécifié**

A Cohesive Deep Drilling Field Strategy for LSST Cosmology

mardi 11 juin 2024 14:00 (25 minutes)

This presentation will summarize a work recently achieved in DESC about the design of a cohesive DDF strategy fulfilling requirements from PZ, WL, SNe Ia and accounting for the SCOC recommendations.

Auteur principal: GRIS, Philippe (LPCA)

Orateur: GRIS, Philippe (LPCA)

Classification de Session: Science talks

ID de Contribution: 11

Type: **Non spécifié**

Rubin LSST data access and analysis via the Rubin Science Platform, an overview.

lundi 10 juin 2024 17:10 (30 minutes)

In this presentation, we will describe how to access Rubin data using the Rubin Science Platform (RSP). We will cover the general features of the RSP: the notebook aspect for the interactive analysis and the portal aspect to inspect catalogs and images.

Finally, we will describe the different data accessible through three different instances of the RSP (USDF, CC-IN2P3 and IDF).

Auteurs principaux: HERNANDEZ, Fabio (CC-IN2P3); Dr MAINETTI, Gabriele (CC-IN2P3); LE BOULC'H, Quentin (CC-IN2P3)

Orateur: Dr MAINETTI, Gabriele (CC-IN2P3)

Classification de Session: Science talks

ID de Contribution: 12

Type: **Non spécifié**

Towards Enabling Automatically Differentiable and distributed Particle-Mesh N-Body simulations

mercredi 12 juin 2024 14:40 (20 minutes)

A series of recent works has highlighted the potential of so-called full-field cosmological inference for the analysis of upcoming weak lensing and galaxy clustering surveys, with the promise of being able to access the non-gaussian information contained in the data. However, these approaches require a differentiable forward model of the large scale structure, which currently constitutes one of the main bottlenecks, as none of the publicly available differentiable N-body codes support large-scale distribution necessary for large cosmological volumes.

To address this, we introduce JAXPM, a JAX-powered library that facilitates multi-GPU and multi-node Particle-Mesh N-body simulations. Leveraging the capabilities of a low-level CUDA distributed computing library, JaxPM allows for the first time the simulation of the entire cosmological volume observed by LSST down to Mpc resolution with an automatically differentiable simulation code.

We will present our early scaling tests of this approach on the Jean-Zay GPU supercomputer.

Auteurs principaux: BOUCAUD, Alexandre (APC / IN2P3); LANUSSE, Francois ({CNRS}UMR7158); KABALAN, Wassim (CNRS APC/IN2P3)

Orateur: KABALAN, Wassim (CNRS APC/IN2P3)

Classification de Session: Science talks

ID de Contribution: 13

Type: **Non spécifié**

Cosmic Shear Simulations for Higher-Order Statistics

mercredi 12 juin 2024 14:20 (20 minutes)

Our main goal is to provide with new cosmic shear and LSS simulations that can be used for the analysis of LSST Y1 data with Higher-Order Statistics. In this presentation, we make an update on the status of the project.

Auteur principal: MENA FERNANDEZ, Juan (LPSC)

Co-auteur: DOUX, Cyrille (LPSC)

Orateur: MENA FERNANDEZ, Juan (LPSC)

Classification de Session: Science talks

ID de Contribution: 14

Type: **Non spécifié**

Updates from the Fink-broker

lundi 10 juin 2024 17:55 (20 minutes)

In this talk, I will describe the most recent updates from the Fink broker, describe the recent developments following the Fink-Brazil Workshop and highlight the actions done towards preparing Fink for the arrival of LSST data.

Auteurs principaux: MOLLER, Anais (Swinburne University); Dr ISHIDA, Emille (CNRS/LPC-Clermont); Dr PELOTON, Julien (CNRS-IJCLab)

Orateur: Dr ISHIDA, Emille (CNRS/LPC-Clermont)

Classification de Session: Science talks

ID de Contribution: 15

Type: Non spécifié

YOLO-CL cluster detection in the Rubin/LSST DC2 simulations

mardi 11 juin 2024 15:25 (20 minutes)

Galaxy clusters serve as powerful probes for cosmological models. Upcoming large-scale optical and infrared surveys will reach unprecedented depths across extensive areas, necessitating highly complete and pure cluster catalogs with well-defined selection functions. We have developed a novel cluster detection algorithm called YOLO-CL. This algorithm is a modified version of the state-of-the-art object detection deep convolutional network YOLO, specifically optimized for galaxy cluster detection (Grishin, Mei, Ilic 2023). It has been adapted to the datasets from the forthcoming LSST by training on a combined sample of observed SDSS clusters and simulated galaxy cluster images from the DESC Data Challenge 2 (DESC DC2).

The YOLO-CL cluster catalog achieves 100% and 94% completeness for halo masses $M_{200c} > 10^{14.6} M_{\odot}$ at $0.2 < z < 0.8$, and $M_{200c} > 10^{14} M_{\odot}$ with redshifts z

lessim1, respectively, with only a 6% false positive rate. Additionally, we found that the YOLO-CL selection function is nearly flat with respect to halo mass within the range 0.2

lessimz

lessim0.9. Our paper detailing the performance of YOLO-CL on DESC DC2 simulated images (Grishin, Mei, Ilic, Aguena, Boutigny et al.) has been submitted for internal review within the DESC collaboration.

Auteurs principaux: BOUTIGNY, Dominique (LAPP); GRISHIN, Kirill (Universite de Paris); Dr AGUENA, Michel (APC); MEI, Simona; ILIC, Stéphane (IJCLab)

Orateur: GRISHIN, Kirill (Universite de Paris)

Classification de Session: Science talks

ID de Contribution: 17

Type: **Non spécifié**

The Rubin Galaxies Science Collaboration

mardi 11 juin 2024 15:45 (15 minutes)

We will present the Rubin Galaxies Science Collaboration, show recent activities and results and explain how to apply for membership.

Auteur principal: MEI, Simona

Orateur: MEI, Simona

Classification de Session: Science talks

ID de Contribution: 18

Type: **Non spécifié**

Effect of Photo-z Performance on Clusters

mardi 11 juin 2024 15:05 (20 minutes)

Photo-z's are a key component for some of the current DESC cluster finders, AMICO and WaZP. In this talk we discuss the effect of photo-z performance on WaZP cluster detection using the new TPZ produced photo-z catalog. We also explore the possibility of optimizing the photo-z training set towards "cluster-focused" samples.

Auteur principal: SOLOMON, Rance (LAPP)

Orateur: SOLOMON, Rance (LAPP)

Classification de Session: Science talks

ID de Contribution: **19**

Type: **Non spécifié**

Welcome!

lundi 10 juin 2024 15:00 (5 minutes)

Orateur: DOUX, Cyrille (LPSC)

Classification de Session: General news and updates

ID de Contribution: **20**

Type: **Non spécifié**

News from Rubin and DESC

lundi 10 juin 2024 15:15 (10 minutes)

Orateur: Dr BREGEON, Johan (IN2P3 LSPC)

Classification de Session: General news and updates

ID de Contribution: **21**

Type: **Non spécifié**

Lightning talks

lundi 10 juin 2024 16:05 (10 minutes)

Orateur: DOUX, Cyrille (LPSC)

Classification de Session: General news and updates

ID de Contribution: **22**

Type: **Non spécifié**

Focal plane

mardi 11 juin 2024 09:30 (1h 15m)

Orateurs: NEVEU, Jérémy (LPNHE); GUILLEMIN, thibault (LAPP)

Classification de Session: Parallel sessions

ID de Contribution: **23**

Type: **Non spécifié**

AuxTel

mercredi 12 juin 2024 09:30 (1h 15m)

Orateurs: Dr DAGORET, Sylvie (IJCLab); MONIEZ, marc (LAL-IN2P3)

Classification de Session: Parallel sessions

ID de Contribution: 24

Type: **Non spécifié**

Euclid/Rubin Derived Data Product Implementation Working Group

mardi 11 juin 2024 11:15 (30 minutes)

Orateur: JULLO, Eric (LAM)

Classification de Session: General news and updates

ID de Contribution: 25

Type: **Non spécifié**

Flash talks

mardi 11 juin 2024 11:45 (20 minutes)

Orateur: DOUX, Cyrille (LPSC)

Classification de Session: General news and updates

ID de Contribution: **26**

Type: **Non spécifié**

Discussion

mardi 11 juin 2024 12:05 (25 minutes)

Orateur: DOUX, Cyrille (LPSC)

Classification de Session: General news and updates

ID de Contribution: 27

Type: **Non spécifié**

EDIM committee

lundi 10 juin 2024 15:05 (10 minutes)

Orateurs: Dr MAINETTI, Gabriele (CC-IN2P3); GINOLIN, Madeleine (IP2I/IN2P3/CNRS); RICCI, Marina

Classification de Session: General news and updates

ID de Contribution: **28**

Type: **Non spécifié**

LSST-France communication

lundi 10 juin 2024 15:55 (10 minutes)

Orateur: SHIFRIN, Gaelle (Centre de Calcul de l'IN2P3)

Classification de Session: General news and updates

ID de Contribution: 29

Type: **Non spécifié**

Feedback from LSST-France focal plane commissioning workshop at LAPP, Annecy

lundi 10 juin 2024 17:40 (15 minutes)

Orateur: GUILLEMIN, thibault (LAPP)

Classification de Session: Science talks

ID de Contribution: **30**

Type: **Non spécifié**

Camera and commissioning news

lundi 10 juin 2024 15:25 (15 minutes)

Orateur: GUILLEMIN, thibault (LAPP)

Classification de Session: General news and updates

ID de Contribution: **31**

Type: **Non spécifié**

DESC-DESI

mercredi 12 juin 2024 11:45 (20 minutes)

Orateur: RAVOUX, Corentin (LPC Clermont-Ferrand CNRS/IN2P3)

Classification de Session: Science talks

ID de Contribution: 32

Type: **Non spécifié**

Computing news

lundi 10 juin 2024 15:40 (15 minutes)

Orateurs: BOUTIGNY, Dominique (LAPP); HERNANDEZ, Fabio (CC-IN2P3)

Classification de Session: General news and updates

ID de Contribution: **33**

Type: **Non spécifié**

Clusters

mercredi 12 juin 2024 09:30 (1h 15m)

Orateur: RICCI, Marina

Classification de Session: Parallel sessions

ID de Contribution: 34

Type: **Non spécifié**

Science validation and commissioning

mardi 11 juin 2024 16:30 (1h 30m)

Orateur: DOUX, Cyrille (LPSC)

Classification de Session: Parallel sessions

ID de Contribution: 35

Type: **Non spécifié**

Update on the LePHARE photometric redshift code

mercredi 12 juin 2024 12:05 (20 minutes)

Orateur: ILBERT, olivier (LAM)

Classification de Session: Science talks