



WP3 OSSR – ESCAPE Repository

Thomas Vuillaume

ESCAPE Progress meeting, Brussels, 26/10/2020



An example of open science project : The Crab bundle

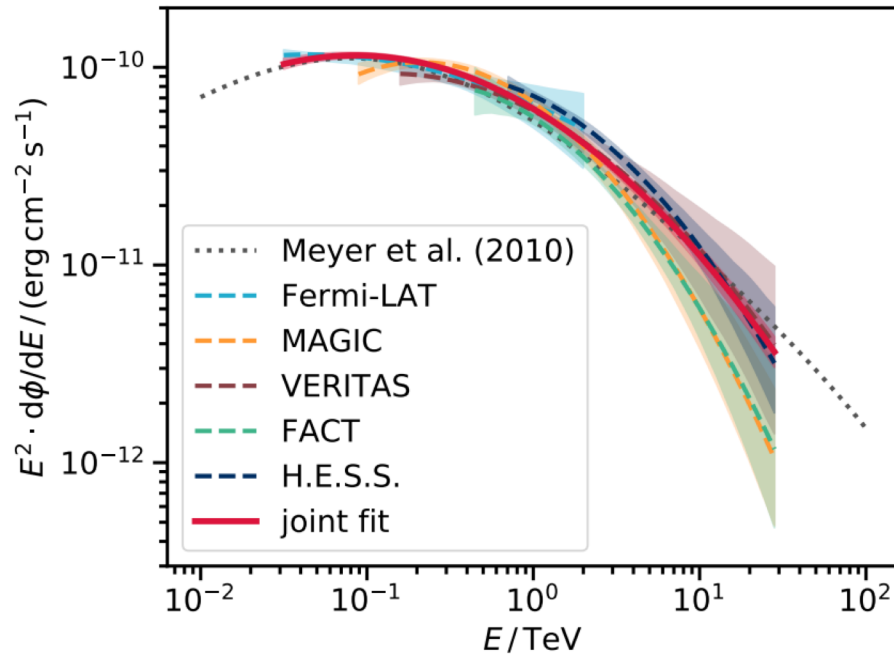


Fig. 2. Crab nebula SED for individual instrument fits and from the joint fit. Single-instrument results are represented with dashed lines, the fit of all the datasets together, labelled as joint, is represented as a thick, solid red line. The shaded areas represent the SED error bands whose calculation is explained in Sect. 3.2. The dotted line shows the model in Meyer et al. (2010).

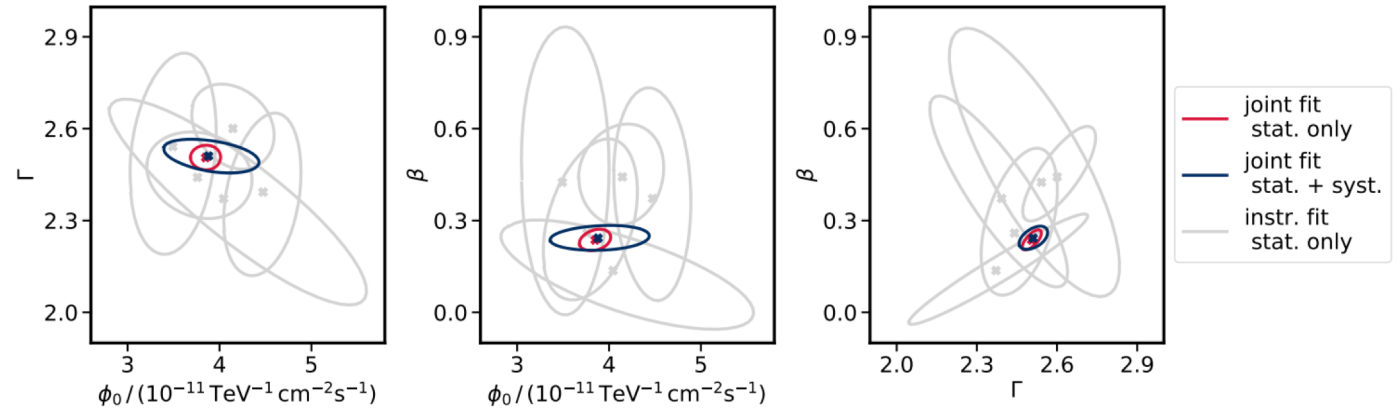


Fig. 5. Likelihood contours corresponding to 68% probability content for the fitted spectral parameters (ϕ_0, Γ, β), for the likelihood in Eq. (1) (red) and the likelihood in Eq. (5) (blue). Results from the individual instruments with the likelihood in Eq. (1) are shown in grey.

Multi-instrument gamma-ray analysis of the Crab Nebulae with Fermi-LAT, MAGIC, VERITAS, FACT and H.E.S.S.

****Towards open and reproducible multi-instrument analysis in gamma-ray astronomy, C. Nigro et al, in A&A 625 (2019)***



An example of open science project : The Crab bundle

The Crab multi-instrument gamma-ray analysis with MAGIC, VERITAS, FACT and H.E.S.S.

<https://github.com/open-gamma-ray-astro/joint-crab/tree/v0.1>

<https://zenodo.org/record/2381863#.XkxcD5NKhhA>

license

License (for files):
[BSD 3-Clause Clear License](#)

Versions

Version v0.1 Dec 18, 2018
 10.5281/zenodo.2381863

Cite all versions? You can cite all versions by using the DOI 10.5281/zenodo.2381862. This DOI represents all versions, and will always resolve to the latest one. [Read more.](#)

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Cite as

C. Nigro, C. Deil, R. Zanin, T. Hassan, J. King, J.E. Ruiz, ... A. Sinha. (2018, December 18). The joint-crab bundle (Version v0.1). Zenodo.
<http://doi.org/10.5281/zenodo.2381863>

Start typing a citation style...

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Cited by

Link to project and article

Cite as

Source code and data

December 18, 2018

Software Open Access

The joint-crab bundle

C. Nigro; C. Deil; R. Zanin; T. Hassan; J. King; J.E. Ruiz; L. Saha; R. Terrier; K. Bruegge; M. Noethe; R. Bird; T. T. Y. Lin; J. Aleksić; C. Boisson; J.L. Contreras; A. Donath; L. Jouvin; N. Kelley-Hoskins; B. Khelifi; K. Kosack; J. Rico; A. Sinha

This **joint-crab** bundle allows for a first reproducible multi-instrument gamma-ray analysis, achieved by using the **prototypical DL3 data format** and the open-source **Gammapy** software package, for a small set of MAGIC, VERITAS, FACT, and H.E.S.S. Crab nebula observations.

Preview

joint-crab-v0.1.zip

- open-gamma-ray-astro-joint-crab-752a165
 - .gitignore 1.2 kB
 - 1_data.ipynb 3.0 kB
 - 2_results.ipynb 6.0 kB
 - 3_systematics.ipynb 100.8 kB
 - 4_naima.ipynb 72.0 kB
 - 5_crab_pulsar_nebula_sed.ipynb 65.4 kB
 - Dockerfile 604 Bytes
 - LICENSE 1.5 kB
 - README.md 4.3 kB
 - analysis.md 2.9 kB
 - binder
 - environment.yml 443 Bytes
 - data
 - README.md 512 Bytes
 - fact
 - 20131103_103_dl3.fits 25.9 kB
 - 20131103_104_dl3.fits 25.9 kB
 - 20131103_105_dl3.fits 23.0 kB

Indexed in

OpenAIRE

Publication date:
December 18, 2018

DOI:
DOI 10.5281/zenodo.2381863

Keyword(s):
Astronomy Gamma-rays Data analysis

Related identifiers:
Referenced by
<https://arxiv.org/abs/1903.06621>

Alternate identifiers:
<https://github.com/open-gamma-ray-astro/joint-crab/tree/v0.1>

Communities:
Astronomy-General

Files (10.1 MB)

Name	Size
open-gamma-ray-astro/joint-crab-v0.1.zip	10.1 MB

md5:55cd7fed91c53f54a96e32945e764665

Beta Citations 1

Show only: ☐ Literature (1) ☐ Dataset (0) ☐ Software (0) ☐ Unknown (0)

☐ Citations to this version

Search

Towards open and reproducible multi-instrument analysis in ... 2019

Nigro, C. et al. (DOI: 10.1051/0004-6361/201834938)

Page size: 10

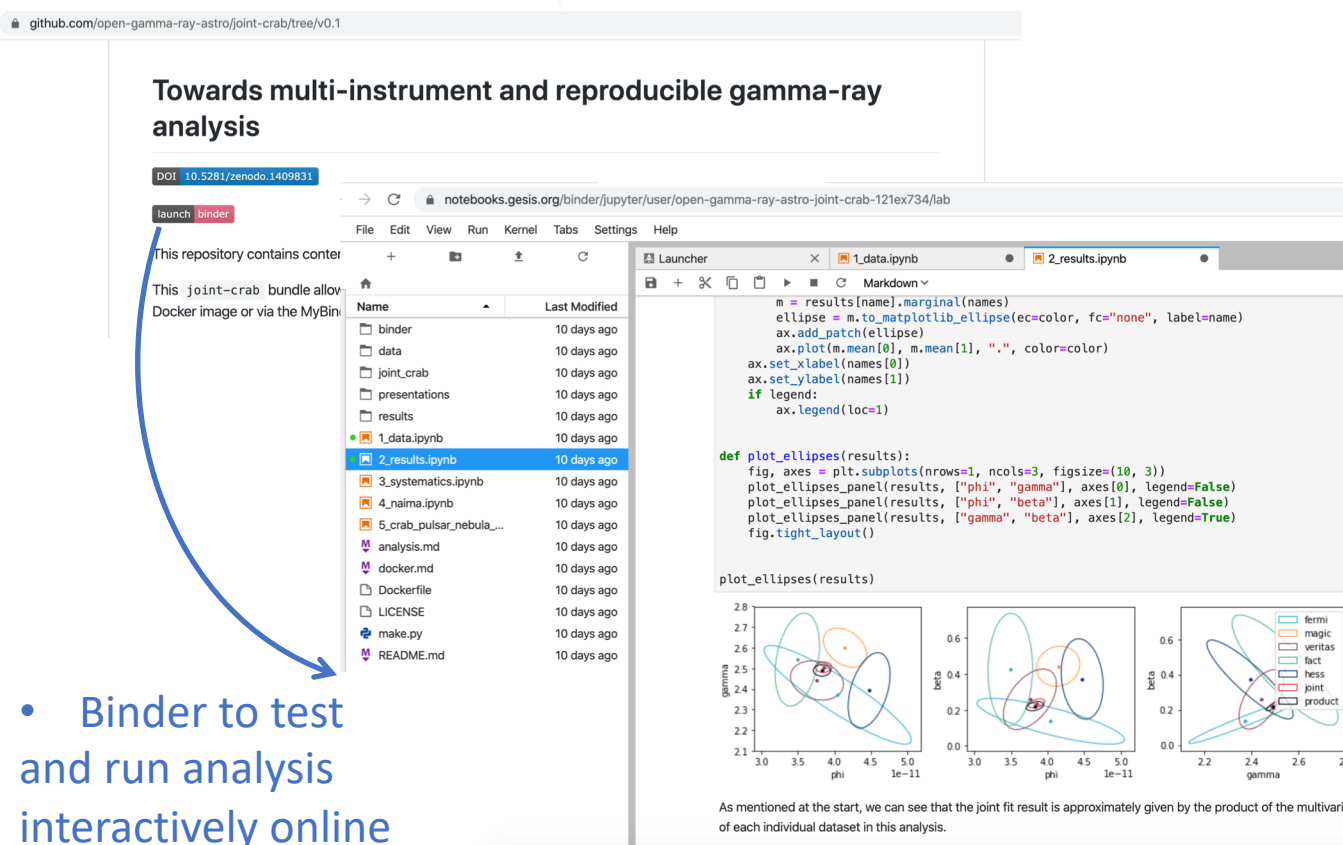


An example of open science project : The Crab bundle

The Crab multi-instrument gamma-ray analysis with MAGIC, VERITAS, FACT and H.E.S.S.

<https://github.com/open-gamma-ray-astro/joint-crab/tree/v0.1>

<https://zenodo.org/record/2381863#.XkxcD5NKhhA>



Towards multi-instrument and reproducible gamma-ray analysis

DOI: 10.5281/zenodo.1409831

launch binder

This repository contains container Docker image or via the MyBinder

Name	Last Modified
binder	10 days ago
data	10 days ago
joint_crab	10 days ago
presentations	10 days ago
results	10 days ago
1_data.ipynb	10 days ago
2_results.ipynb	10 days ago
3_systematics.ipynb	10 days ago
4_naima.ipynb	10 days ago
5_crab_pulsar_nebula_...	10 days ago
analysis.md	10 days ago
docker.md	10 days ago
Dockerfile	10 days ago
LICENSE	10 days ago
make.py	10 days ago
README.md	10 days ago

File Edit View Run Kernel Tabs Settings Help

Launcher

```

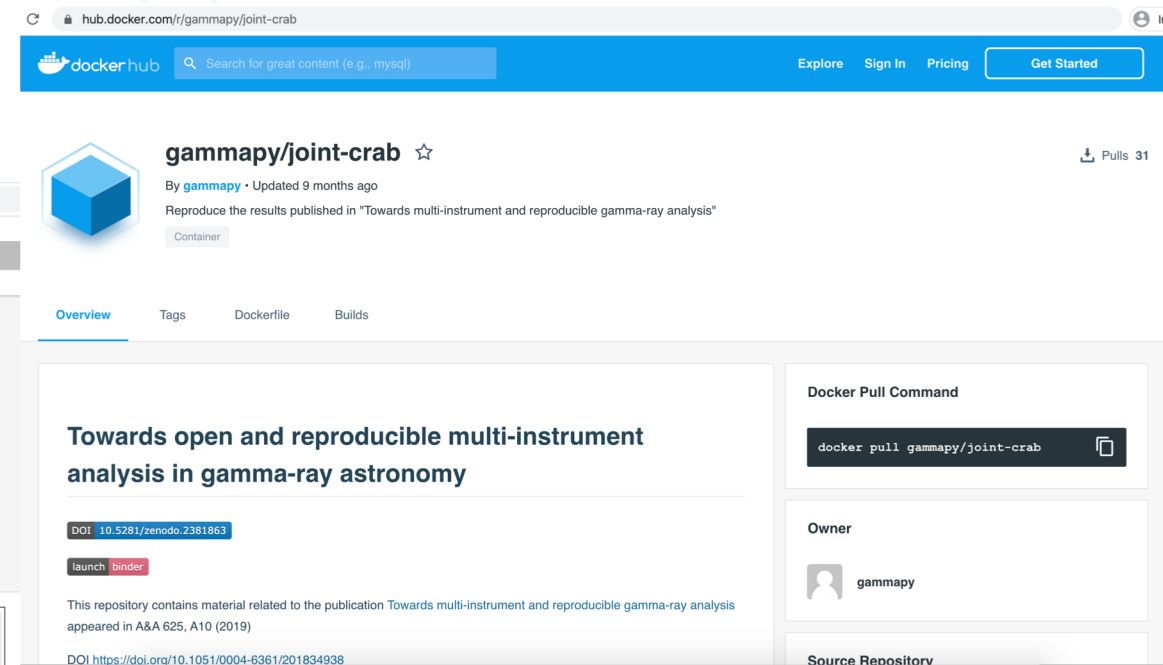
m = results[name].marginal(names)
ellipse = m.to_matplotlib_ellipse(ec=ec, fc="none", label=name)
ax.add_patch(ellipse)
ax.plot(m.mean[0], m.mean[1], ".", color=ec)
ax.set_xlabel(names[0])
ax.set_ylabel(names[1])
if legend:
    ax.legend(loc=1)

def plot_ellipses(results):
    fig, axes = plt.subplots(nrows=1, ncols=3, figsize=(10, 3))
    plot_ellipses_panel(results, ["phi", "gamma"], axes[0], legend=False)
    plot_ellipses_panel(results, ["phi", "beta"], axes[1], legend=False)
    plot_ellipses_panel(results, ["gamma", "beta"], axes[2], legend=True)
    fig.tight_layout()

plot_ellipses(results)

```

As mentioned at the start, we can see that the joint fit result is approximately given by the product of the multivariate normal approximation for the of each individual dataset in this analysis.



hub.docker.com/r/gammapy/joint-crab

docker hub Search for great content (e.g., mysql) Explore Sign In Pricing Get Started

gammapy/joint-crab ☆

By gammapy · Updated 9 months ago

Reproduce the results published in "Towards multi-instrument and reproducible gamma-ray analysis"

Container

Overview Tags Dockerfile Builds

Towards open and reproducible multi-instrument analysis in gamma-ray astronomy

DOI: 10.5281/zenodo.2381863

launch binder

This repository contains material related to the publication Towards multi-instrument and reproducible gamma-ray analysis appeared in A&A 625, A10 (2019)

DOI <https://doi.org/10.1051/0004-6361/20184938>

Docker Pull Command

```
docker pull gammapy/joint-crab
```

Owner

gammapy

Source Repository

- Docker to ensure reproducibility



ESCAPE Virtual Environment

Now imagine this as a **standard**,
in an **integrated environment** - with a single login,
allowing you to (re-)**run** (part of) **any analysis**,
with another **dataset**,
and easily **publish** your new results,
automatically **giving credit** to original analysis, datasets, workflows...



ESCAPE Virtual Environment

How ?



ESCAPE Virtual Environment

1. Promote and implement **FAIR*** principles

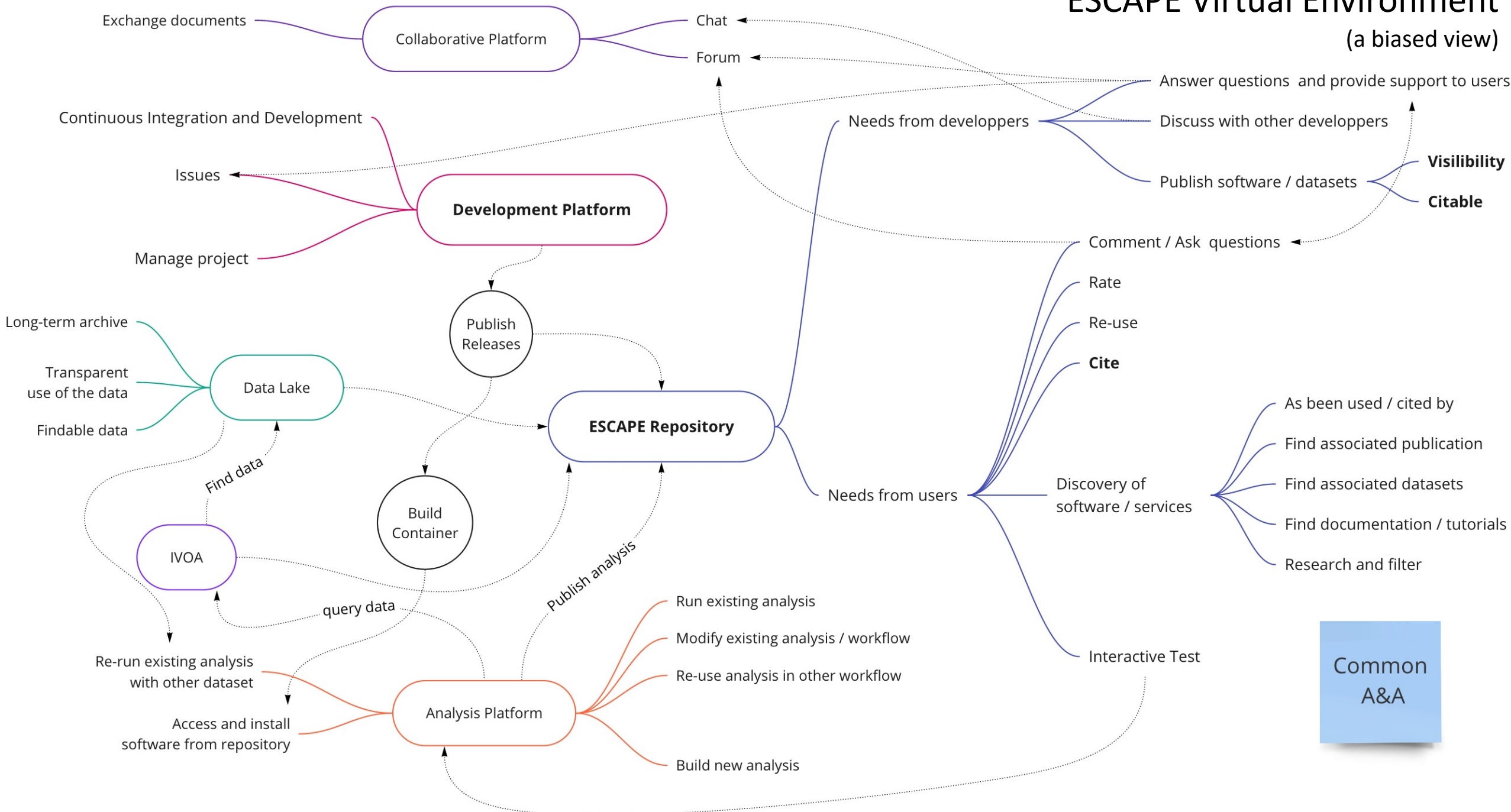
- **Findable** → Rich metadata, **unique** and **persistent** identifier
 - **Accessible** → Metadata and data are **understandable** to **humans** and **machines**. Data is deposited in a **trusted repository**.
 - **Interoperable** → Metadata use a formal, accessible, shared, and broadly applicable language for knowledge representation.
 - **Reusable** → Data and collections have a **clear** usage **licenses** and provide accurate information on **provenance**.
- ## 2. Provide the **infrastructure** and **services** to foster FAIR (effortless) contributions

→ ESCAPE Virtual Environment



ESCAPE Virtual Environment

(a biased view)



Technical implementation ?



Survey on the repository needs

- *Do you have one or several repositories in place within your ESF/RI and how are they implemented?*
- *What features do you expect from the OSSR repository?*
- *How would your ESF/RI transfer the software and services to the OSSR (transferring the full development, adding stable releases or similar?)*
- *What software licenses, versioning and means of preservation do you employ?*
- *How does your ESF/RI implement the FAIR principles to software, services and relevant data to test those, what means are in place for long-term preservation, maintenance and curation?*
- *What features do you expect from the OSSR repository?*
- ...



Development platform: Gitlab

<https://gitlab.in2p3.fr/escape2020>

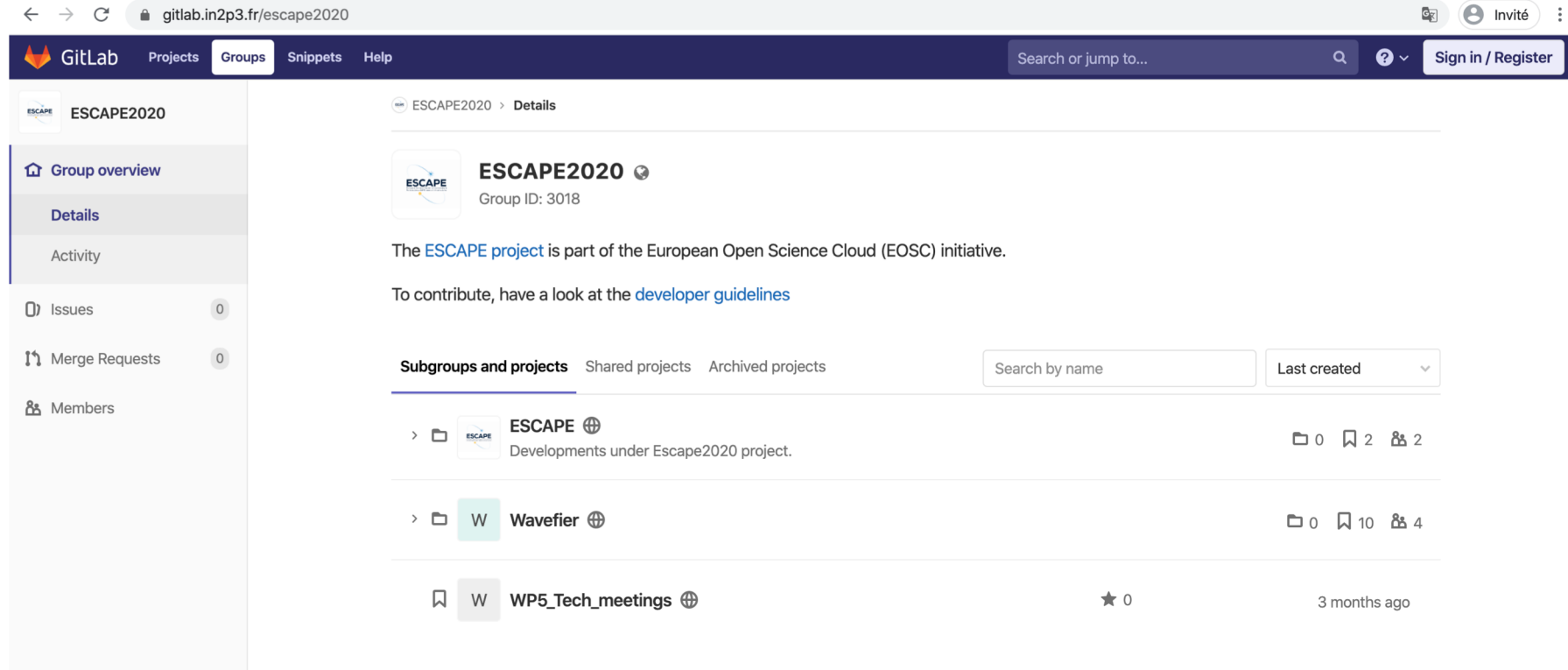
Gitlab IN2P3

Welcome !

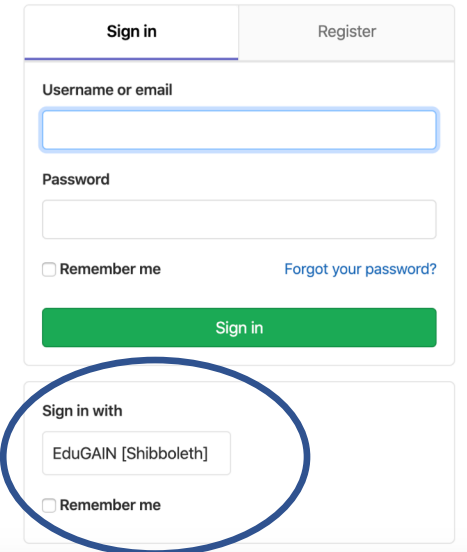
IN2P3 AND ACADEMIC USERS MUST **SIGN-UP AND REGISTER** WITH
[Shibboleth]

New users are automatically set as *External* for validation, **except** when
registering with **[Shibboleth]** (EduGAIN, Fédération d'Identités RENATER).

Please take a moment to read the [documentation](#).



The screenshot shows the GitLab IN2P3 website. The top navigation bar includes links for Projects, Groups, Snippets, and Help. The main content area displays the details for the ESCAPE2020 group (Group ID: 3018). It includes a description of the project as part of the European Open Science Cloud (EOSC) initiative and a link to the developer guidelines. Below this, there is a section for Subgroups and projects, listing ESCAPE, Wavefier, and WP5_Tech_meetings.



The screenshot shows the sign-in form on the GitLab IN2P3 website. It includes fields for Username or email and Password, a Remember me checkbox, and a Sign in button. Below the form, there is a section for Sign in with EduGAIN [Shibboleth], which is circled in blue. This section also includes a Remember me checkbox.

Sign in with EduGain



Development platform: Gitlab

	+	-
Github or gitlab as a service	<ul style="list-style-type: none"> - Free for open source - No setup - Integration with lot of services - Huge community 	<ul style="list-style-type: none"> - Data stored outside the E.U. - No control over the data & conditions of use - No control of accounts
Gitlab as a software	<ul style="list-style-type: none"> - Private projects - Control - Open source 	<ul style="list-style-type: none"> - Setup, install, maintenance of the service - Costs - Less integration with other services



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Concept implementation with Zenodo service

<https://zenodo.org/communities/escape2020>

ESCAPE 2020

All versions

Access Right

☐ Open (4)

File Type

☐ Zip (2)

☐ Gz (1)

☐ Md (1)

Keywords

☐ CTA (2)

☐ ESCAPE (1)

☐ Machine Learning, Big Data,
Aapche Kafka, Gravitational Wave (1)

☐ Convolution (1)

☐ Data Format (1)

☐ Machine Learning (1)

Found 4 results.

< 1 >

Sort by:

Most recent

asc.

View

February 7, 2020 (0.1) Software Open Access

ctape_io_mchdf5

 Vuillaume, Thomas; Aubert, Pierre; Garcia, Enrique;

ctape plugin for reading and converting Monte-Carlo files (contains the same information as Simtel files)

Uploaded on February 7, 2020

December 12, 2019 (1.0) Software Open Access

Template for an ESCAPE project

Garcia, Enrique;  Vuillaume, Thomas;

A template to provide software to the ESCAPE project (<https://projectescape.eu/>)

Uploaded on December 12, 2019

August 1, 2019 (1.0) Software Open Access

A prototype for a real time pipeline for the detection of transient signals and their automatic classification

 Elena Cuoco; Emanuel Marzini; Filip Morawski; Alessandro Petrocelli; Alessandro Staniscia;

WaveFier is the result of an industrial collaboration project with Trust-IT Services LTD Chase Side Enfield, Middlesex - EN2 6NF - UK and "CNRS - Center National de la Recherche Scientifique in Paris" acting in behalf of the "Laboratori d'Annecy de physique des particules - LA

keywords allow
to filter by
science project
or research
infrastructure



Zenodo as a service vs Zenodo as an application

	+	-
Zeondo as a service	<ul style="list-style-type: none"> - Free - No setup - CERN support - Secure, very long time, archive - Always up to date 	<ul style="list-style-type: none"> - Size limitation to 50GB per upload (an agreement is possible for bigger datasets) - No multiple ownership as of today - No multiple curators as of today - Limited customization
Zenodo as a software	<ul style="list-style-type: none"> - Better branding - Own the data - Custom front-end - Custom A&A 	<ul style="list-style-type: none"> - Need time and money to dev/setup/install - Need computing infrastructure - Need maintenance - Future ?



Zenodo as a service vs Zenodo as an application

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Note: Some of the limitations from « Zenodo as a service » will be overcome in the future or can be discussed with the Zenodo team through an agreement for developments.



Now what ?

1. **Connect** the services to create an integrated environment
2. Define **metadata**
 - For humans
 - For machines
3. Define a **template** to upload software (<-> metadata)
4. Propose **license** and **provenance** model (<-> metadata)
5. **Feed** the repository with ESCAPE developments
 - **CORSIKA** containers and DIRAC as middleware (from Task 3.3)
 - **Innovative workflows** and test science cases (from Task 3.4)
 - **Software** from partner survey (task 3.2)
6. Feed to repository with test **science projects** (see session tomorrow)
7. Repeat



Community Driven Repository, Organised by Science Projects

- Starting a new Science projet (through validation) sets up a complete virtual environment
- Researchers / Institutes contribute to the science project by publishing software / workflow / data
- The contributions are validated by science project curators
- Users can search the repository or explore it through the science projects



Discussions during joint actions session

Some questions now?

