# FINAL REPORT

# CONFERENCE ASSEMBLY TOOL (CAT, WAS JPSP-NG)

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# 1  Scope of the document

The Conference Assembly Tool (CAT) is the new tool developed within the JACoW collaboration to create IPAC proceedings from Indico events. This completes the transition from the SPMS to Indico for conference management (excluded the JACoW Central Repository, as described in section 7).

CAT is the new name chosen in place of the former JPSP-NG; these two names can be independently used to identify the same project, but only CAT will be used for the final product.

The JPSP-NG project is described in the document "Technical Specification – JPSP-NG" by Ivan Andrian, released on 27 May 2022. The present report will send back to that document for all the requirements, resources and schedule.

This document describes the achievements of this project with particular emphasis to what is now available to the IPAC (and to the whole JACoW) community. A critical analysis of the coming challenges will complete the report.

# 2  Main stakeholders and development model

The creation of the Conference Assembly Tool has been possible thanks to the three IPAC areas (EMEA, Americas and Asia/Australasia). EPS-AG , APS-DPB and NSRRC financed the JPSP-NG project providing 25k EUR for a total contribution of 75k EUR. Elettra Sincrotrone Trieste sustained the internal costs for the time of the project leader.

The development was outsourced to Akera Srl (https://www.akera.it/), an Italian software company selected among five initial contenders.

The software has been released under a Free Open Source (FOSS) license to enable easy and free future development by any laboratory organising JACoW conferences, eliminating any possible license fees to the original developers.

Source code, together with full documentation for developers and users are freely available on JACoW's Github account (https://github.com/JACoW-org) and are listed here in section 8.

CAT actually is a tool made of two different software components that work together to create the needed artefacts. Both parts are written in Python.

## 2.1 Proceedings Utility Running Remotely – PURR

PURR is an Indico plug-in that must be installed on the same server where the Indico instance is running. For IPAC/JACoW, this means indico.jacow.org at CERN.

The main role of this product is to provide a user interface in Indico, to trigger all actions needed to create the output, to access the data needed for the CAT processing directly from the Indico database and to offer high-level APIs to the external web application which is the actual worker.

Having part of the software strictly connected to Indico by way of its plug-in system allows high performances in data retrieval compared to an all-external web application.

### *2.2 Machine Editor for cOnferences Website – MEOW*

The actual worker for all the tasks that CAT offers is MEOW, a web application installed on one or more servers possibly different than the one where Indico is installed.

This allows to better tailor the structure and functionalities of CAT. For example it permits to use a custom MEOW instance for one event without interfering with all the other Indico events.

MEOW is triggered by PURR and through it retrieves the data from the Indico database by way of customised APIs. It then returns to the user the results of its calculations.

When analysing features and processes, we will refer to CAT as a single tool without the need to identifying the role of PURR or MEOW for every task.

## 3 **CAT funtionalities**

CAT presents a new interface in Indico from which it is possible to:

- create the abstracts booklet of the conferences
- perform checks on the PDF files uploaded in Indico prior the proceedings creation
- create the pre-publication proceedings
- create the final proceedings for publication on JACoW.org which consist of:
  - a static website that offers easy navigation through the materials
  - a proceedings PDF with all papers indexed in a single file
  - a "proceedings at a glance" PDF with the first page of every paper, linked directly to the complete, single file, paper
  - indexes by session, classification, author, institute, keywords
- create and register the DOIs through DataCite.

All these operations are managed from Indico via the CAT interface (figure 1).
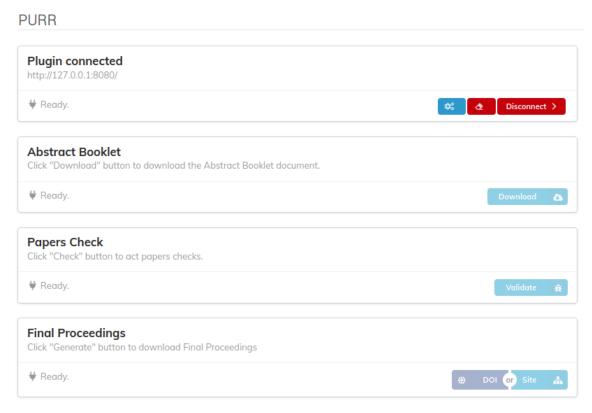
*Figure 1: Main CAT interface in Indico*

Every action uses the Indico event settings plus the specific CAT ones, as depicted in figure 2.



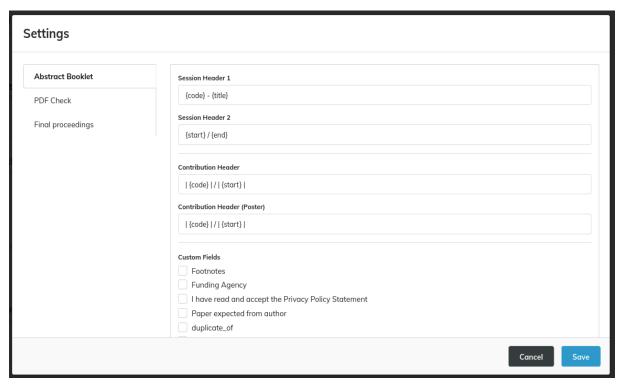*Figure 2: CAT settings (Abstract Booklet)*

All operations are performed on the server and launched by the controls in the CAT interface. Real time feedback of any task is given through the same screens. Figure 3 shows the details of the creation of the proceedings for a conference.
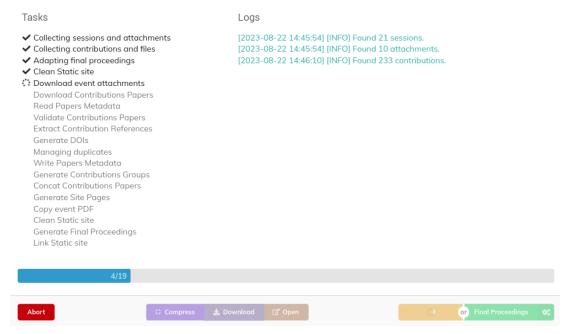


Figure 3: Progress of proceedings creation

An important functionality is the registration and publication of DOIs on doi.org through DataCite (figure 4).
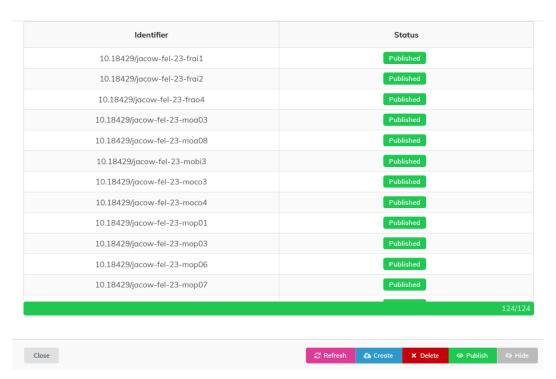


Figure 4: Digital Object Identifier management

## 4  First uses of CAT

The schedule and deliverables plan of the project included two real conferences: FEL2022 and IPAC'23. These real cases where used both as special development test-beds and as the first two conferences whose proceedings have been created and published through CAT (figures 5 and 6).

Proceedings of the
**40th International Free Electron Laser Conference**

**FEL2022**

The links below lead to detailed listings of the many facets of the conference, including Portable Acrobat Format (PDF) files of all invited and contributed papers, together with slides from oral presentations and PDFs from poster sessions.

Index of papers by:
- **Session**
- **Classification**
- **Author**
- **Institute**
- **DOI per Institute**
- **Keyword**

- **FEL2022 Proceedings Volume** (220 MB)
  *The complete volume of papers*
- **FEL2022 Proceedings at a glance** (35 MB)
  *First page only of all papers with hyperlinks to complete versions*
- **FEL2022 Abstract Booklet** (2.7 MB)

- **Programme (synoptic table)** (217 kB)
- **Conference photos** (54 MB)

**FEL2022** was hosted by **Elettra-Sincrotrone Trieste S.C.p.A.** and held at the **Trieste Convention Center** in Trieste, Italy 22-26 Aug 2022

https://www.fel2022.org

*Figure 5: FEL2022 proceedings by CAT, on JACoW.org*

Proceedings of the

# IPAC'23

**14th International Particle Accelerator Conference**

The links below lead to detailed listings of the many facets of the conference, including Portable Acrobat Format (PDF) files of all invited and contributed papers, together with slides from oral presentations and PDFs from poster sessions.

Index of papers by:
- Session
- Classification
- Author
- Institute
- DOI per Institute
- Keyword

- **IPAC'23 Proceedings Volume** (2.1 GB)
  *The complete volume of papers*
- **IPAC'23 Proceedings at a glance** (519.2 MB)
  *First page only of all papers with hyperlinks to complete versions*
- **IPAC'23 synoptic table** (96.3 kB)
- **IPAC'23 photobook** (11.5 MB)

**IPAC'23** was jointly organised by **Istituto Nazionale di Fisica Nucleare** and **Elettra Sincrotrone Trieste** in **Venice, Italy** from **7 to 12 May 2023** at the Venice Convention Centre.

Editorial Board:
Ralph Assmann - Deutsches Elektronen-Synchrotron DESY
Peter McIntosh - Science and Technology Facilities Council (STFC/DL/ASTeC)
Giovanni Bisoffi - Istituto Nazionale di Fisica Nucleare (INFN/LNL)
Alessandro Fabris - Elettra-Sincrotrone Trieste S.C.p.A.
Ivan Andrian - Elettra-Sincrotrone Trieste S.C.p.A.
Giulia Vinicola - Istituto Nazionale di Fisica Nucleare (INFN/LNF)

*Figure 6: IPAC'23 proceedings by CAT, on JACoW.org*

# 5  Brief analysis of costs and times

Elettra signed a contract with Akera in August 2022 for the delivery of CAT at a cost of 75k EUR, taxes included.

As per the technical specifications document, the final deliverable was expected by August 2023. All requirements and deliverables were respected by Akera, which permitted to create the two conference proceedings described in section 4 on time. The software company also assisted in the use of the product with the IPAC'23 conference during the first part of 2023, including constant support during the editing process in Venice.

# 6  Current status and future maintenance needs

The project has been completed in August 2023 by Akera and in December 2023 Elettra closed its internal coordination project. CAT, installed in Indico version 3.3, is fully functional and now in use by IPAC'24. At present IPAC'25, ERL2024, eeFACT2025, ECRIS2025, FEL2024, LINAC2024 already have Indico events created and being used.

Akera offered to fix bugs possibly discovered after the end of the contract for development. This was already performed through December 2023 and now the product could be considered mature.

Today there is no maintenance contract active with the software company: this implies that any bugs or misbehaviours discovered now on need to be solved outside the development agreement. This could also be needed due to future changes in Indico itself. For example, Akera already had to modify CAT when it was complete to adhere to the new Indico release version 3.3, which brought some modifications in the database structure for the paper editing. This affected how CAT was creating the proceedings, so it needed to be updated before the final release.

An example of the need for a future maintenance is already expected: during the 2023 JACoW Team Meeting the group of JACoW experts asked the Indico developers to introduce the functionality of multiple affiliations for every person listed in an abstract or contribution. At present Indico does not allow this: only one affiliation is considered, and CAT was built with this specification. The Indico developers accepted this request so now this feature is under development. However, whenever it will be released, this will affect CAT by breaking all lists and indexes by institute in the proceedings.

These scenarios suggest that IPACs, together with JACoW, plan for some actions that will guarantee a full functional tool for the proceedings creation.

I can propose two options:

1. the institute or institutes organising the conference reserve some resources (part time of an in-house Python developer) for this maintenance. This will create a small team of at least two persons available at any time in the conference lifecycle: in fact, every year there are two active IPACs under way;

2. any IPAC provides a small line in its conference budget for such maintenance and outsources the task to an external company.

Both approaches has some positive and negative aspects. Having in-house developers on this task would avoid any commercial intercourse and any additional related costs. Moreover, every conference is already dedicating an IT manager to the conference organisation; this person could also cover this development, as anticipated in the JPSP-NG Technical Specification document. On the contrary, the learning curve to become proficient in maintaining CAT could be steep, and after two years (when the IPAC is over) this developer would leave this "maintenance team".

The second approach could cost more in terms of real money, since commercial companies need to profit from their services. However, for the conference organisers this could be an easier path that won't involve securing other resources from the LOC.

Being CAT open source any conference is free to choose any software company they liked. Obviously Akera – being the original developer – already has the best know-how on CAT, so it may become the natural choice for the job.

This new maintenance needs could be a good occasion for the IPACCC to review the terms of relationship with JACoW in the "Memorandum of Understanding for Coordination of IPACs Held in Asia, Europe and the Americas".

# 7  The JACoW Central Repository

The transition from the SPMS to Indico is complete for what relates to the actual conference management. However, the Central Repository (i.e., the database of all JACoW personal profiles and accounts) still is managed by a special instance of the SPMS at CERN; the JACoW Indico is synchronised with it to guarantee data consistency. For the same reasons presented in the JPSP-NG Technical Specifications a urgent replacement of this last instance of SPMS is needed. However, it's not clear if the Central Repository will be brought directly in Indico or will be replaced by a different software, to which Indico will need to connect. The JACoW Board of Directors is working on this project that will imply some modifications also to Indico, regardless of the chosen solution.

# 8  Final project resources

## 8.1 Software code

1. CAT: https://github.com/JACoW-org/CAT
2. PURR: https://github.com/JACoW-org/PURR
3. MEOW: https://github.com/JACoW-org/MEOW

## 8.2 Documentation

1. CAT: https://cat-docs.jacow.org
2. PURR: https://purr-docs.jacow.org
3. MEOW: https://meow-docs.jacow.org
4. How to organise IPACs with Indico and CAT: https://ipac-docs.jacow.org

# 9  Acknowledgements