

Geant4-papers

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Motivation for a Geant4 Repository

- **Current State:**

- ▶ Papers, presentations, and important documents related to Geant4 are scattered across various places.
- ▶ No centralized repository exists to easily search, access, and link relevant content.

- **Challenges:**

- ▶ Lack of organized storage leads to difficulties in finding important resources.

Proposed Solution

Inspiration:

- Based on the successful **CMS ECAL Plot Repository**, created by Grigory Latyshev, Federico Ferri (CEA, Saclay), and me.
- The repository has been running since **2021** without major interventions and is a **static site** hosted by CERN IT.
- [Check the CMS ECAL Approved Plots](#)

How It is Used in CMS:

- CMS has several **Detector Performance Groups (DPGs)** (e.g., HGCAL DPG, ECAL DPG, HCAL DPG), responsible for detector-related studies.
- Results must pass through the **DPS Approval** process before being shown at international conferences.
- Subsystems store "approved" plots in dedicated repositories, with correspondent associated metadata (title, date, tags, caption).
- An **Angular-based website** allows filtering of plots based on session names and tags.

Create a Similar Application for Geant4 Papers

- Instead of plots, users will filter **PDF files** containing **Geant4-related papers**.

```
{
  "title": "Experience in using Geant4 on the GRID",
  "authors": [
    "Alberto Ribon", "Giovanni Santin", "Witold Pokorski"
  ],
  "original_link": "https://indico.cern.ch/event/199138/contributions/378776/"
}
```

- Metadata includes **title**, **authors**, **year**, **links** to Indico records or journals, and relevant **tags**.
- **PNG files** of the first page of presentations will be stored alongside PDFs to enhance the visual appearance.

Key Features

- **Static Site for Reliability:** The application will be static for easier maintenance and deployment, like the CMS ECAL repository.
- **Metadata Support:** Each document will include metadata like title, authors, date, and tags.
- **Search & Filtering:** Users can search and filter based on tags - physics area, authors, and year.
- **User-Friendly Interface:** Built with Angular and optimized for both desktop and mobile use.

Technology Stack

- **Static Site with Angular:** The site will be built using Angular, with the final output being fully static files.
- **Apache Server:** The static files will be served using a standard Apache server.
- **CI/CD Pipeline:** Automated deployment using GitLab CI for continuous updates.
- **Content Storage:** All papers, presentations, and metadata will be stored in GitLab repositories, utilizing Git LFS for large files.




Workflow for Users, same as geant4.cern.ch

- **Submit:** Users clone the repository, add their paper or presentation, and commit it along with its metadata.
- **Merge Request:** Create a merge request to update the repository.
- **Deployment:** Once approved, the content is automatically deployed and available on the website.
- **Accessibility:** All content can be searched and accessed via the web interface, with options for downloading.

First Prototype of the Geant4 Repository

Abe 1	Ahmed 1	Allison 4	Amadio 4	Apotolakis 10	Arce 3	Archer 3	Arsini 1	Asai 10	BOLDARD 1	Bagli 1	Bair 3	Bandleramonte 7
Banerjee 4	Barranti 2	Beck 1	Berie 1	Bisai 1	Blagost 1	Bordage 1	Brandt 1	Brown 20	Brzozowska 1	Bukkappathin 1	Burkhardt 1	
Casal 4	Cappelletto 1	Carminati 1	Castro 1	Cembranos 1	Chakma 1	Chapman 1	Cho 2	Cirrone 4	Cooperman 1	Cortes-Giraldo 1		
Coamo 10	Delage 1	Desorgher 8	Dang 3	Dotti 10	Dumontiel 1	Eian 1	Elvira 4	Fattori 1	Felger 7	Garnier 9	Gayer 2	Gensik 11
Gheata 4	Gibaru 1	Girardo 1	Graf 1	Griech 4	Guatelli 20	Gumlinger 4	Hahnfeld 1	Hosokawa 1	Howard 12	Hirayama 42	Hugo 3	
Hwang 1	Winn 1	Incarti 3	Inguibert 3	Ivanchenko 16	Jeon 1	Johnson 1	Jones 2	Jun 10	Kemperle 1	Kelsay 14	Khaan 3	Kol 3
Konstantinov 1	Kostelnik 1	Kurehige 2	Kyriakou 1	Latyshov 1	Lee 3	Lestani 1	Li 1	Lima 3	Machwiden 1	Madsen 3	Magni 2	
Maire 1	Mancusi 1	Martino 1	Marshall 1	Matsura 1	Michael 1	Mizusa 1	Morgan 23	Murakami 10	Muñoz 1	Nicotani 1	Novak 6	
Omer 1	Pandola 1	Palermo 1	Palomá 1	Pardi 1	Perri 10	Perrot 1	Petringa 1	Pezzatti 1	Pico 4	Pokorski 16	Rame 2	Ribon 27
Ritach 1	Romano 1	Salamani 1	Sand 1	Santini 1	Sasaki 4	Sato 1	Sawky 1	Schenk 1	Schwarz 1	Sechopoulos 1	Semenov 4	
Seaton-Kennedy 1	Shin 1	Stancari 1	Stewart 1	Sutherland 1	Sytov 1	Tchemiaev 1	Terracciano 1	Thuliez 1	Tiwari 1	Tran 4	Urban 1	
Ushinski 1	Uzhinsky 1	Verderi 20	Vita 1	Wendt 1	Wenzel 10	Wright 20	Yarba 10	Zaborowska 7	Zharenov 2	Zhuzhi 1	Reest	

Advanced Examples WG Basic and Extended Examples WG CM 2023 Hokaido Documentation WG G4Analysis GUI Geant4 None Reest

 <p>Geant4 Develop, Build and Test Tools Update Ben Morgan</p> <p>Update on Development and Build Tools Author(s): Benjamin Morgan</p> <p>DOI Link:</p> <p>None</p>	 <p>Users community engagement</p> <p>Communicating with users – The web forum and the technical forum Author(s): Benjamin Morgan, Marilena Bandleramonte</p> <p>DOI Link:</p> <p>None</p>	 <p>Geant4 Library Modularization Status and Plans Ben Morgan</p> <p>Modular libraries in release 11 Author(s): Benjamin Morgan</p> <p>DOI Link:</p> <p>None</p>
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- Python script was written to download all PDF files from Geant4 collaboration meetings of 2011-2013, 2020-2023.
- Spent a day developing the first prototype of the website.
- The prototype is far from fully functional version but demonstrates that the solution should work.

Conclusion & Next Steps

- **Impact:** A centralized repository for Geant4 resources will simplify access to important papers and presentations.
- **Next Steps:**
 - ▶ create the **Geant4-papers** repository following the accepted structure and start populating it.
 - ▶ gather requirements from **Geant4 members** to ensure the repository meets the Geant4 community's needs.
 - ▶ Begin development using the same approach as the CMS ECAL repository.