4th General Paper

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The first 3 Geant4 **general** papers

- "*Geant4 – a simulation toolkit*", NIM A 506 (**2003**), 250-303

  - 128 authors

  - Based on the first versions of Geant4 (1.0, 2.0, *etc.*), not indicated explicitly

- "*Geant4 Developments and Applications*", IEEE TNS, 53 (**2006**), 270-278

  - 73 authors

  - "*The new features described in this paper are publicly available in Geant4 version **7.0**, released in December 2004, and following versions*"

- "*Recent developments in Geant4*", NIM A 835 (**2016**), 186-225

  - 99 authors

  - "*[…]. The remainder of the paper will deal with other improvements in the toolkit since the last Geant4 general paper. […] Major changes and developments in the Geant4 tookit took place between 8.1 and **10.1** releases […]*."

It's time for the 4th general paper!

- It should cover the decade **2015 - 2024**, *i.e.* G4 versions **10.2 - 11.3**

- To be written in **2025**, and mostly based on G4 **11.3**

- To be submitted and (hopefully) published in **2026**

  - NIM A seems a good choice…

  - Targeting **~50 pages** in total

Note: as usual, it is recommended to write, as much as possible, Geant4
    ***specific* papers** – with detailed description of the work, and authored
    by the real contributors – while summarizing and citing those in the
    general paper.
    If you are planning to do so, please start as quickly as possible,
    ideally publishing before end of 2025.

Structure of the paper

- We don't need to reinvent the wheel: as a starting point, we can reuse the structure used in the third paper – which was also an update of ~10 years of developments

- *"Geant4 update: from version **10.2 (2015)** to **11.3 (2024)**"*

  - The evolution of Geant4

  - Tasking

  - Kernel functionalities

    - Including: 'Tracking and scoring', 'Detector modeling' (geometry), 'Visualisation'

  - Recent developments in physics modeling

    - Including: 'Electromagnetic physics', 'Hadronic physics', Physics lists', 'Results'

  - Toolkit extensions

    - Including: 'Biasing' and 'Analysis'   + FastSim (classical + ML) ?

  - Validation

    - Including: 'Release tools' and 'Physics validation tools'

  - Outlook for the next decade

A tentative organisation & schedule

- Before end of this year, define the sections and main writers for each of them
  - Starting with the related WG coordinators and deputies, plus relevant experts and volunteers (ideally, with at least one native English speaker per section)
- Regular communication encouraged between the writers of each section
  - By emails and Zoom meetings
- Overall status of the paper: Zoom meeting each quarter, with at least one writer per section
  - Open and advertised to all Geant4 members
  - Status update in each Steering Board meeting
- First draft to be discussed at the next Collaboration Meeting
  - Including figures, tables, bibliography and proposed authors
  - A mature, complete draft expected by the end of 2025

Practicalities

- We need one (or more) **editor(s)** of the paper

  - Dennis Wright and John Allison had this role for the 3rd paper
    - A big job done extremely well!
  - Please come forward if you are interested to take this role
    - The role of the editor is to check for missing pieces, duplications, lack of consistency between the various sections (in size, details, English style, *etc.*), improve the text, write or rewrite some parts, *etc.*
    - As spokesperson, I'll be involved at least in calling meetings, reminding deadlines, *etc.*

- We need to decide how to share the Latex of the paper

  - GitLab or Overleaf ?

- We need to decide the starting Latex structure (split in sections)

  - We can start with a generic structure, or the one used for the 3rd general paper, or directly with the journal of choice by contacting them early on

- Anything else?

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