



भारता परमाणु अनुसंधान केंद्र
BHABHA ATOMIC RESEARCH CENTRE



GeantV – Introduction to the community meeting

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Community Meeting Charge

- ▶ The panel is asked to evaluate progress and give recommendations on the following topics:
 - The degree to which the project has demonstrated it can meet its goals in a realistic application (realistic events in a realistic detector)
 - The ability of the new particle transport framework to fully exploit parallelisation in all its forms and to deliver a substantial performance gain as compared to the existing simulation engine, Geant4
 - The suitability of the new particle transport framework to perform fast and full simulation with the possibility of mixing the two modes in different regions of the geometrical setup and/or for different particle types and momenta,
 - The impact of any changes to the implementation of physics models that may be needed in order to achieve the stated improvements in software performance,
 - The credibility of the project plan (deliverables, timeline, and human resources) for delivering a new simulation toolkit on a timescale that matches the schedule of the experiments allowing for the time that will be needed for integrating user code and validating physics performance;
 - Assess the extent to which opportunities to leverage GeantV work in the near term are being sought and exploited, for example by integrating GeantV-directed geometry improvements in Geant4;
 - Assess whether the most important risks have been identified and whether adequate attention is being given to addressing them;
 - Assess the project's approach to ensuring experiment framework compatibility, ease of migration to GeantV, and interoperation of GeantV with other toolkits (particularly Geant4).
 - Any other comments or recommendations that the panel considers to be appropriate are welcome as well.

https://docs.google.com/document/d/104EPbRpOC6cqCtDF4tzHLE0KSrVL2lc_xexiDfYtO0/edit#heading=h.2yjcsh11ae9

Proposed format of the meeting

Agenda at <https://indico.cern.ch/event/570876>

- ▶ Tuesday, October 25
 - Morning: Presentations
 - Afternoon: Presentations

- ▶ Wednesday, October 26
 - Morning: Presentation overflow and Q&A
 - Afternoon: possible spill-over & Closed session

- ▶ Thursday
 - Morning: Report from the panel
 - Lunch together

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 - Afternoon: Discussion with panel on feedback

What is our overall goal?

- ▶ Develop an all-particle transport simulation software with
 - Optimized GEANT4 or new improved (where appropriate) physics models
 - A performance between 2 and 5 times greater than GEANT4
 - Full simulation and various options for fast simulation seamlessly integrated
 - Portable on different architectures, including accelerators (GPUs, Xeon Phi's & more if affinity)
- ▶ Understand the limiting factors for a one-order-of-magnitude (10x) improvement

What we will show you

- ▶ Short history and rationale for the project
- ▶ Current status & results of the various activities
- ▶ Future perspectives & open questions

IMPORTANT REMARK

- ▶ No decision is cast in stone
 - This is just the best we could do
- ▶ If you do not agree with us and have good ideas, they are

WELCOME

What we would like to hear

- ▶ Compliments of course 😊
- ▶ Your suggestions on how best to proceed and what we are missing
- ▶ How HSF could help us to engage the community at large

Let the party begin!