



Usability Issues

Documentation

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16 January 2009



Recommendation 23

- We recommend **updating the documentation on the** web right away, and formulating a plan to have periodic reviews of the web site to keep it up to date.
- *Improved physics sections, showing the validation, in both EM and hadronic physics, explaining the uses in medical physics, and a number of other targeted areas. Amongst other areas, papers, proceedings and preprints in physics areas are up-to-date in the respective areas.*
- *Beyond these targeted areas, the improvement of the web site has not been a priority during the past 20 months, and remains a lower priority than physics improvement and validation, identifying and fixing reported issues and problems, and providing support for inquiries which affect users.*
- *Given the effort on validation, testing and physics improvements, and the strong manpower constraints, improvement in other areas has not been a priority.*



Recommendation 23 (cont.): updating the web

- New contributors offer one avenue for undertaking improvement, and have contributed in major ways. Christina Zacharatou has created the new 'Medical Physics' section, in consultation/collaboration with low energy WG members and medical physicists. Pages on the physics lists are included.
- Priority to document the physics lists utilised in particular application areas has been agreed as the current priority for improvement, at the Geant4 Workshop in October 2008. A plan to implement these for other areas is not yet formulated. It will be considered as part of the planning for 2009.



Recommendation 24

- We recommend that Geant4 document the **limitations, and validity and applicability ranges** of the different EM and hadronic models, and the physics lists. Where models have overlapping validity ranges, document the **tradeoffs**.
- *The main source of information on Geant4 physics models is the Physics Reference Manual guide, which includes detailed descriptions of models, sampling mechanisms, references to original publications and databases, estimation of validity range and accuracy. Additional information is available on the Geant4 web pages.*
- *A [prototype of this documentation](#) is already complete and accessible from the Geant4 web pages. Since this was deployed, two shortcomings have been noted: it is difficult to maintain, especially as models and physics lists are added or updated; it duplicates some existing documents leading to possible inconsistencies. We plan to improve these pages first by listing only expected and validated energy ranges of applicability for each model, and second by adding for each model a link to a page which describes the model, its limitations and its relation to other models. Also listed there would be expected trade-offs in accuracy and speed. Each page would be written and maintained by model authors or maintainers and could include links to the Physics Reference Manual.*



Recommendation 25

- We recommend that Geant4 **improve** its code documentation. Example approaches by other groups include Doxygen, and README files that can be browsed in LXR.
- *We have provided two types of code documentation since several years:*
 - *the annotated header files in the Software Reference Manual (created via tool, using code annotations of developers);*
 - *an LXR installation, with full search and cross-linking between classes.*
- *In order to make the LXR installation better known, we created a dedicated link for it on our download area. In addition, we have been providing (but until now not making widely known) a Doxygen based Geant4 documentation on the KEK Geant4 web site at <http://www-geant4.kek.jp/Reference>. We consider it provides no more than our Software Reference Manual (SRM) and existing LXR documentation.*
 - *Our tools create automatically a software manual by extracting special comments of header files created by developers. Doxygen offers the same functionality.*
 - *We do see adequate benefit for changing the comment format, to accommodate Doxygen instead of our SRM - and cannot currently justify the effort to change the entire source codes.*
- *We are now (in the process of) providing new links in the Documentation page, for the LXR and Doxygen services, next to the Software Reference Manual, to aid users in finding these tools.*



Recommendation 26

- We recommend *improving the release notes* with the addition of expected changes in physics and computing performances, while keeping the current extensive list of code change descriptions. We encourage strengthening the editorial coordination of the release note preparation.
- *Regarding the "addition of expected changes in physics and computing performances", please see the answer to recommendation #15.*
- *Constantly made effort in last years to improve the release notes*
 - *taking into account the input and requests from the users community and experiments, regarding the level of details and relevant information to be provided.*
- *Specific sections added.on:*
 - *on migration of the users code,*
 - *computing and physics performance,*
 - *known issues and major new features have been*
and are now integral part of the notes
- *The draft notes are circulated to an agreed set of collaborators, for proof reading and further improvement.*



Recommendation 27

- We recommend that Geant4 review the current **installation procedure** with the aim of adding conveniences for users, such as additional defaults, self configuring procedure, a template .spec file to create an RPM in the user's environment.
- *Current work has focused on the urgent task of improving the Geant4 Configure script and make system due to support issues of the underlying metaconfig tool. This is the biggest installation issue across all systems.*
 - *We are studying alternatives to propose a new tool.*
 - *The draft target for this is end 2009.*
- *With lower priority, we are also studying how to provide an RPM distribution for Linux*
 - *A significant complication in doing this is the extensive use of environment variables for configuring installation parameters, including locations of CLHEP, data libraries, visualisation options, ...*
- *Manpower has been a limitation, as the WG coordinator is now also coordinator and key person for the system testing integration*