

ILC Beamline description language meeting

ALCPG / GDE meeting

24 October 2007, 1530-1630 Central time

Attending: G. Dugan, S. Molloy (webex), J.M. Paterson, D. Rubin, D. Sagan (webex), N. Solyak, PT, N. Walker, A. Wolski, M. Woodley (webex)

Discussion on the possible use of Accelerator Markup Language (AML) as a future standard language for ILC beamlines. At this time all beamlines are described via Extended Standard Input Format (XSIF), a format based on MAD-8 with extensions (apertures, arbitrary coordinate changes, linear acceleration). AML is an XML-based language standard which allows a much more complete description of any accelerator or accelerator complex; eases the addition of new components or parameters; and simplifies software maintenance, since professional software engineers maintain freeware XML parsers (as opposed to XSIF, where physicists maintain the software).

N. Walker presented a slide on the possible benefits to the collaboration: a more accurate description of the accelerator for simulators, including series-powering of magnets (so that simulators will know not to try and excite magnets independently if they are “in real life” powered in series); the ability to track much larger amounts of information in the lattice file, which is relevant to the engineers as well as the physicists – ultimately the lattice file can either contain all the engineering specifications or else it can act as a central data node, containing links from each element to its specifications elsewhere in EDMS. This would eliminate a lot of fragile administrative controls which are currently used to connect a particular element in a particular beamline file to its engineering information (“Oh, yeah, we just know that all the quads upstream of the “WKXVJ” marker are Q20L200V1’s, and all the ones downstream are Q20L200V2’s”). The downsides are that migration to the new language will require work, buy-in from the users and originators of the lattice files, and a migration plan.

Dave Sagan briefly described the Universal Accelerator Parser (UAP), a general-purpose parsing tool which can read BMAD, MAD-X, MAD-8, and AML formats, and which can be connected via standard techniques to any beam dynamics or beamline design software package. There was discussion of connecting UAP to MAD-X, but it turned out that Frank Schmidt was officially discouraged from working on things not directly related to getting LHC up and running.

Some discussion of the possible time-frame for a migration to AML. A suggestion was put forward that we could plan to start the migration in mid-2008 – at that time, ILC would support lattice files in both XSIF and AML formats, and make an equivalent file tree of lattice files available in each language. The end-point of the migration would be on the order of 24 months after the start, at which time area leaders would have to provide lattice files in AML. ILC might or might not choose to maintain a parallel and equivalent set of XSIF files from that point forward, depending on various factors

(mainly the workload of generating an XSIF version of each AML file, and whether our experience indicated that it is hard to keep the two versions fully synchronized).

At the moment the Cornell ERL project is using AML. There is some interest in the language at CERN (for PLACET) and at Tech-X, amongst other places.

A tentative plan for moving forward was approved:

- The Systems Integration group will put together as inclusive a contact list as possible for future discussions: the area leaders, their deck masters, the simulations group, J.M. Paterson, N. Walker, M. Woodley, PT.
- PT will assemble a draft proposal for the migration: what additional information we would want to include in the AML files by the end of the ED phase, the plan for supporting two languages and then obsoleting XSIF, etc., and some thoughts on coding standards (since it is always possible to write a lattice file that looks like a dog's breakfast in any language, no matter how elegant the language nominally is). This draft will be circulated for comments to the contact list.
- A few weeks after the draft goes out we will have a webex meeting for further discussion.
- Hopefully after a couple of rounds of revision and discussion, we would be ready to seek the blessing of ILC Management.