Rivet development issues

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Rivet collaboration meeting, 28–31 May 2013

Format of this meeting

"Self-organising", cf. Les Houches. (a.k.a. I don't know!)
Theme: improving on past *ad hoc* decisions.

Want to get a good mix of discussion/planning and actual starts on coding activity. Maybe $2 \times$ Vidyo-enabled discussions per day?

Areas for discussion / development:

- **Histogramming and stats (Rivet/YODA):**
  - multi-weights *and* run merging
  - *and* loop re-entry / persistency
  - error calculation
  - correlations
  - plotting tools (learn from matplotlib and rootpy interfaces)
- **Physics infrastructure:**
  - improve jets (constituent specification, tagging mechanisms, substructure – 100% focus on FastJet3?)
  - improve "finder" projections
  - get logically combinable `Cut` system operational
  - analysing particle decay chains
- **More?** e.g. important missing analyses? BSM use?

Areas for development

- **NLO and multi-weight histos** (and multi-errors, arbitrary object binning, etc. – YODA stuff)
  - Error treatment (cf. Frank & Simon)
  - Get multi-error analysis working with plotted bands as default behaviour
  - Re-entering the event loop
  - Discarding "TMP" histos after `finalize()`
  - `BinnedHistogram`: hone? Use YODA `Axis`/`Binning`?
- **Requirement upgrades:** C++11? FastJet3? Eigen3? (HepMC3??)
- **Jets system overhaul:** require FastJet3, improve tagging and substructure power
- **Cuts system:** when fully used, this is a *major* (good) API change. Variations on **http://pastebin.com/DbG36iCv**
- **Particle data:** use/rewrite HepPDT?

Areas for development (2)

- Defining promptness... and other general HepMC analysis tools (from "mcutils").
- W and Z finder improvements? Adding tau and top finders?
- Decay chains
- Split analysis distribution from Rivet core?
- Eliminate `NeedsCrossSection`: it should *always* be present if using a new-enough HepMC.
- Plotting system: rewrite make-plots to abstract much of the rendering into a (thread-safe) util library
- Helping the BSM users

Last Rivet 2.0.0 TODOs

- Use `#pragma once` – simpler header guard, more robust I think, fully supported AFAICT
- Remove defunct stuff: `HistoHandler`?, `HistoFormat`?, `Constraints` and `BeamConstraint`? `Tools/TypeTraits`?
- YODA ROOT output and `*2root` scripts
- Add `eq(a, b, tol)`, `safeDivide(a, b)`?
- $1.0 \rightarrow$ weight issues in `ATLAS_2011_I945498`?
- [Last analysis mergings (subjet and ATLAS 2PC analyses, etc.)]
- Remove cone image from doc – screws up on arXiv

Actually a Rivet 1.x thing, but **thanks to Frank S for doing the hard work on finally getting the Rivet manual journal-published!**

Misc "ASAP" TODOs

Web page: add a "HOW TO SUBMIT YOUR ANALYSIS" page, emphasising need for it to compile, run, reproduce the paper, and be maintainable (prominently link to style guide)

Fix Jenkins setup! Need new versions of dependency libraries – all builds have been failing for *ages*

Release & development strategy
Immediate

- **1.8.4???**
  - If we do it, this should be the absolute last point in the 1.x series.
  - Only motivated by desire for continuity: including latest analyses in their submitted form, allows immediate `mcplots` use.
  - Do we want this or not? If so, do it this week.
- **2.0.0**
  - This week, please **:-)**
  - Very few (if any) remaining issues.
  - Main one: should we include the ~ 3 newly submitted analyses or wait for 2.0.1?
  - Also "fix" statistics with hist err $\sim \sqrt{\sum w^2} \to$ proper std dev?
  - Want it installed on lxplus and bootstrap updated for Les Houches next week. Also need YODA 1.0.1

Release & development strategy
Next 6 months / year / beyond

- **2.1.0**
  - I'm thinking of this as a nominal release for multi-weight / counter-event histogramming, re-entrant event loop, factorised `finalize()`, etc.
  - Also development of `Cut`s, improved jet system, etc.: *all for discussion/work this week & at Les Houches next week*

- **3.x**
  - The above might be big changes for a 2nd digit release... and probably too optimistic!
  - There is some psychology in version numbers: if $1 \rightarrow 2$ is "traumatic" for some users, a rapid "v3" release might seem scary
  - Play it by ear.

Attach the "development areas" items (and more from you) to these releases according to our individual/collective priorities.

Meeting logistics

Meeting/work rooms: XXXXXXXXX

Wifi: Eduroam should work for most of us. For students, too? What about non-eduroamers (do we have any?)

Agenda/Vidyo: XXXXXXXXX

Lunch/dinner: up to you what you want to do, but I suggest that we collectively do whatever Gavin/Jon recommend ;‑)
Splitting/booking probably necessary (we're a pretty big group)

Claiming accom/travel/food: MCnet UCL should be usable:
Jon/others to advise on procedure.
Karl and Dave on my IPPP grant: collect receipts. I don't mind paying for your meals to protect your cashflow!