

Rivet monthly dev meeting

7 August 2024

Recent activity / TODOs

- **Rivet 4.0.1 + YODA 2.0.1 releases**

- HepMC compression conflict resolved with minimal version-dependence patch
- Peter R analyses and patches incorporated: thanks! → version 3.1.11 as/if and when
- Many plotting improvements (thanks to Chris G) ⇒ **main remaining issue is speed**
- YODA Profile bin-volume factor fixed
- rivet-merge cross-section averaging improved (again) with exact sumW/Ntrial info
- Slight tweak in Estimate calculation from empty bins in non-profile histos
- Various build and Inspire/mkanalysis improvements
- Dockers built and deployed (except rivet-herwig: Herwig not yet R4-compatible)

- **Publications**

- Rivet4 release note response from SciPost Codebases:
<https://scipost.org/submission/2404.15984v2/>

- **GSoC developments**

- Abhi D has been working on code coverage and (multi-architecture) Docker builds from CI
- gcov aspect nearly done on YODA, Chris G will extend to Rivet: new scripts to appear
- Docker multiarch setup done, requires some integration with current interactive scripts

Next major feature ideas

- **Improved primary-particle definitions for EIC/ALICE & LLPs** (cf. [tools workshop](#))
 - Requires predicate functions for definitions of primariness
⇒ technical issue: std::functions are not comparable... work-arounds? Key to caching
 - Default FS behaviour to move away from get status = 1: semantic change
 - Database for historic τ_0 tests; particle-specific τ or position for BSM LLPs
⇒ **discuss with Louie/Sihyun re. fiducial LLP definitions (also e.g. LHCb)**
 - *Careful* rollout and regression testing needed
- **HI framework**
 - Scatters→Estimates (Leif, Christian B?)
 - Test impact-param and secondary-vertex tools
 - HI jet subtraction mechanism?
 - Post-processing script system: auto-discovery and running of fits etc.?
- **Flavour-sensitive kT clustering in LeptonFinder** (AB → some prototyping, awkward in FJ)
- **Experimental systematics?** At all possible via reweighting? Projection options?!

Meetings, coordination, etc.

- **Requests for CMS / ATLAS / ALICE / FCC / other Rivet & Contur tutorials**
⇒ ATLAS cross-group interest, asked to propose dates. Suggested **14 Oct ATLAS week** or **8 Nov Physics Week + focus on new PhD students** ⇒ **no response yet: AB pinged today**
⇒ **Other expts? Alex G to put interested LHCb people (and those with analysis queries) in touch with Rivet team for support/events; ~5 new LHCb analyses also in preparation**
- **In-person events to meet around**
 - Aspen amplitudes/tools workshop, Aug-Sep (Jon, Andy, Deepak, Peter S)
- **MCnet COST network application by Oct 23**
 - Sourcing feedback from MCnet management (2 inputs so far). MC performance one aspect. Broadening to neutrino and broader “precision simulation” possible: can’t tie to speculatives like FCC — easy to kill a contingent application.
- **Rivet and Contur in OpenMAPP recast network**
 - Discussion on extension of our Inspire-Rivet name-mapping JSON (used by HEPData) for all tools. Martin H on that and signal-region covariance studies between tools

AOB

- **TODO: filtering to show only most-crucial analyses on coverage pages**
⇒ maybe? Subjective, risks constructive avoidance of “second class” analyses
- **TODO: add Mac CI runner config in Gitlab CI (via GSoC)**
(CERN IT don't plan Mac CI runners on the CERN Gitlab in the foreseeable future.)
- **Request for ntupling, specifically EDM4HEP format**
AB wrapper analysis base-class half-written; format of FCCAnalysis not 100% clear. Example requested. EDM4HEP could do with modernisation ⇒ MCnet input
- **HEPData sync update from Rivet; linked theory predictions in HD require Inspire**
Still need a real test case, but this seems workable: an arXiv tech note is low threshold.
Push into HEPData from Rivet analyses with no HD → bulk upload facility identified
- **heprivet.org web page (and YODA, LHAPDF...)**
Needs some imminent person-power to finish. Current developments ongoing (through GSoC and between CG, Max Knobbe and AB for LHAPDF visualisation and data submission). Tech & design for doc/test/coverage data passing can be reused

BACKUP