

Novel tools and observables for jet physics in heavy-ion collisions

Introduction



TH-institute “Novel tools and observables for jet physics in heavy-ion collisions”

Wed 23 Aug - Fri 01 Sep

Working groups, plenary meetings

Seminars, intro talks

Social program

P.S.: *this document is available from the TH-institute Indico page (<https://indico.cern.ch/event/625585/overview>)*

Goal

bringing together experimentalists and theorists working on the **phenomenology of jets in heavy ion collisions**

aim to facilitate cooperation [Lisbon accord, RIVET, JetScape]

consolidate field in order to extract properties of the medium

Where do we go in the future?

Working groups

mini-presentations/discussions

setting up studies with toy-models & studying constraints from pp physics using generated MC data

compile data comparisons

compile model comparisons: what models contain what?

⇒ **collaborative tool** (you have access/can modify)

⇒ **mailing list!**



KonradTywoniuk
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TWiki > JetQuenchingTools Web > WebHome (2017-07-13, MartaVerweij)

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TH insititute "Novel tools and observables for jet physics in heavy-ion collisions" and the 5th Heavy Ion Jet Workshop

Welcome to the TWiki of the TH insititute "Novel tools and observables for jet physics in heavy-ion collisions" and the 5th Heavy Ion Jet Workshop

The indico page with talks can be found here: [indico](#)

Working groups

To start up the program, we suggest to organize ourselves into three working groups (WGs):

- TH insititute "Novel tools and observables for jet physics in heavy-ion collisions" and the 5th Heavy Ion Jet Workshop
 - Working groups
 - WG1 Precision jet quenching observables
 - WG2 Jet quenching in substructure/"boosted" observables
 - WG3 New theoretical tools and MC implementations
 - Common discussion points
 - Possible internal WG tasks
 - Goals of the institute
 - JetQuenchingTools Web Utilities

WG1) Precision jet quenching observables

- Observables:** jet inclusive spectra, heavy-quark jets, di-jet, hadron-jet, photon-jet, heavy boson-jet, jet energy flow, high-pt hadron data
- how sensitive are these observables to medium effects vs. vacuum/fragmentation effects and fluctuating background?
- jet quenching in small systems: what are the observables?
- Conveners:** Dennis, Matthew, Yacine

WG2) Jet quenching in substructure/"boosted" observables

- Observables:** multi-prong objects, jet shapes, splitting function, two-in-prong yields, correlations, heavy-boson decays
- what do we want to learn? can we tag medium-induced bremsstrahlung?
- what are the relevant tools (tagging, pruning, filtering, grooming)?
- how sensitive are these observables to medium effects?
- Working group twiki: [JetSubstructure](#)
- Conveners:** Marta, Leticia, Matteo

WG3) New theoretical tools and MC implementations

- vacuum fragmentation
- medium-modifications (energy loss,...)
- (de)coherence effects

<https://twiki.cern.ch/twiki/bin/viewauth/JetQuenchingTools/WebHome>

Working group planning



Identify on goals/tasks

discussions, ideas, brief presentations, numerical tasks

Divide tasks

different tasks, different interests; split/merge

Progress plan

do the work here and/or continue after the end of institute?

Recap in plenary sessions

WG's are organic:
you suggest
topics/ideas

WG can merge/split
during the institute -
think where you would
like to participate.

JetQuenchingTool S

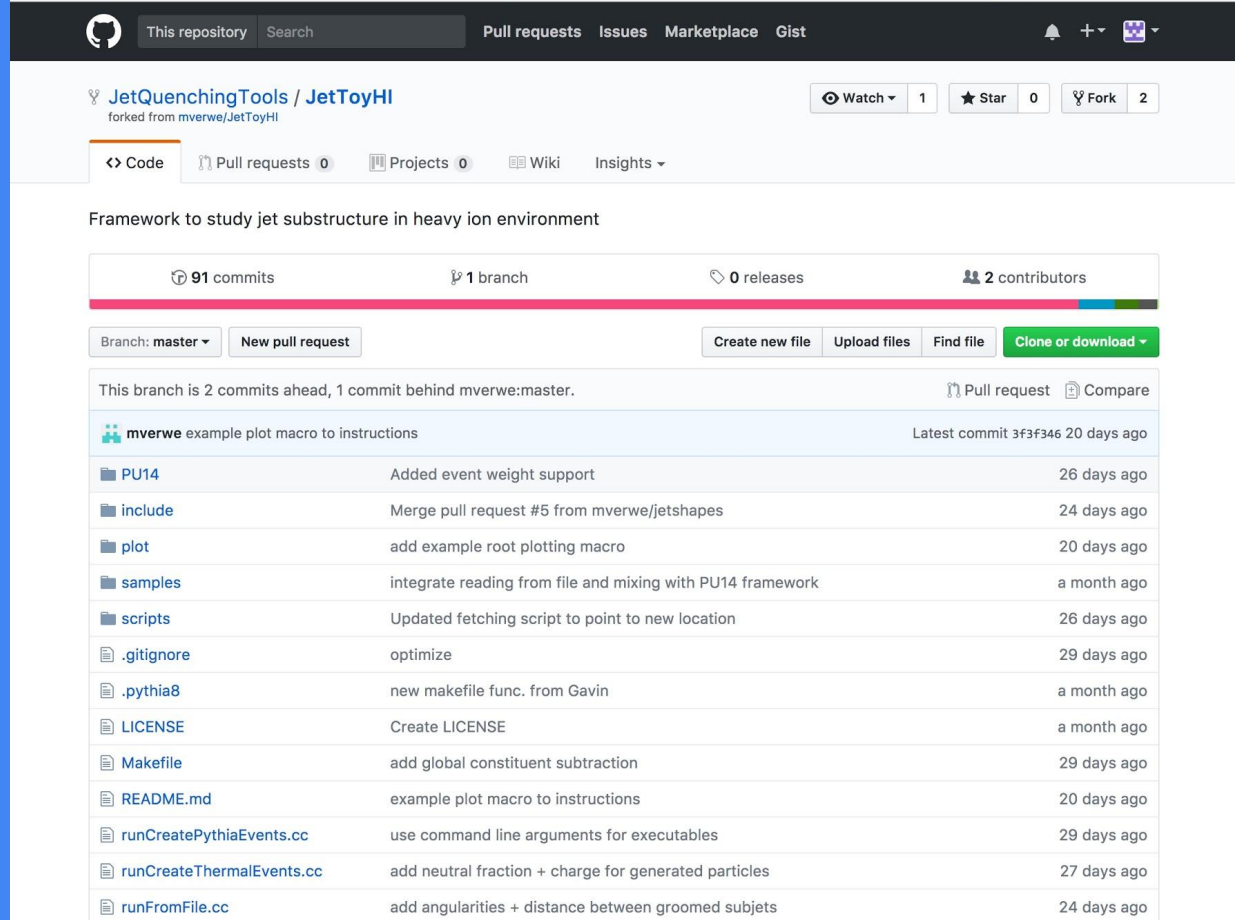
Courtesy Marta Verweij/Yi Chen 🙏
(adapted from on PU14 workshop (G. Salam))

event samples on EOS +FastJet + jet
substructure tools

possibility to do toy studies during/in
the aftermath of the institute

(currently) works on lxplus.cern.ch

try to download
& install!



JetQuenchingTools / JetToyHI
forked from mverwe/jettoyhi

<> Code Pull requests 0 Projects 0 Wiki Insights

Framework to study jet substructure in heavy ion environment

91 commits 1 branch 0 releases 2 contributors

Branch: master New pull request Create new file Upload files Find file Clone or download

This branch is 2 commits ahead, 1 commit behind mverwe:master. Pull request Compare

Folder/File	Description	Time Ago
mverwe example plot macro to instructions		Latest commit 3f3f346 20 days ago
PU14	Added event weight support	26 days ago
include	Merge pull request #5 from mverwe/jetshapes	24 days ago
plot	add example root plotting macro	20 days ago
samples	integrate reading from file and mixing with PU14 framework	a month ago
scripts	Updated fetching script to point to new location	26 days ago
.gitignore	optimize	29 days ago
.pythia8	new makefile func. from Gavin	a month ago
LICENSE	Create LICENSE	a month ago
Makefile	add global constituent subtraction	29 days ago
README.md	example plot macro to instructions	20 days ago
runCreatePythiaEvents.cc	use command line arguments for executables	29 days ago
runCreateThermalEvents.cc	add neutral fraction + charge for generated particles	27 days ago
runFromFile.cc	add angularities + distance between groomed subjects	24 days ago

<https://github.com/JetQuenchingTools/JetToyHI>
<https://account.cern.ch/account/Externals/>

Deliverables

continuing collaboration/working group activity

future meetings with similar format (ala Les Houches)

report/statement of interest (to be submitted autumn 2017)

Seminars/intro talks

Wed 23 Aug (now): Yen-Jie Lee “Studies of medium response with jets and hadrons, where we are?” (60-6-015 - Charpak)

Thu 24 Aug (14:00): Phil Harris “Jets in pp: reconstruction and techniques” (60-6-015 - Charpak)

Fri 25 Aug (14:00): Dingu Shao “Nonglobal effects on jet shape resummation” (Particle/Astroparticly Theory Seminar, 4-3-006 - TH Conference Room)

Mon 28 Aug (14:00): Carlos Salgado “Status of jet quenching theory and phenomenology in heavy-ion collisions” (4-3-006 - TH Conference Room)

Plenary sessions (tentative...)

Fri 25 Aug (after seminar): recap week 1

Mon 28 Aug: start-up week 2 (those who are around ;))

Wed 30 Aug: mid-week recap

Frid 01 Sep: recap week 2 & end of institute

Location & social activities

We are “localised” in TH department (2nd floor: coffee room, discussion room, seminar room; 3rd floor: auditorium, discussion room)

Check room booking!

TH-department coffee room blackboard

Twiki (?)/mailing list

Additionally:

Dinner/after-work (Thu?)

Saturday: anybody interested in hiking? [Jura is in the backyard...]

Three rooms (Wed afternoon):

- here (Charpak)
- 4-S-030 (TH department basement)
- 4-2-037 (TH department seminar room)

Three WG's