News and Introduction on the V+HF meeting series

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on behalf of the LHC Electroweak: Jets & EW Bosons Working Group

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Status of the group

Conveners Team

ATLAS: Eram Rizvi, Ben Nachman

CMS: Vieri Candelise, Hannes Jung **-> Mikko Voutilainen**

LHCb: Stephen Farry, Will Barter

Theory: Marek Schoenherr

ALICE: James Mulligan

Meeting Time&Date **MONDAY 4pm on Vydio**

NEW! Meeting Schedule

Our Twiki page: https://twiki.cern.ch/twiki/bin/view/LHCPhysics/EWWG2

Our meeting page: https://indico.cern.ch/category/3290/

List of our ongoing activities

Main Ongoing Activities

!!! CRITICAL

- Benchmark Comparisons: historically the main task of the EW-VJ group, aiming for theory/data comparisons of selected processes (e.g. V+jets), observables and given predictions between ATLAS, CMS, LHCb at 7/8/13 TeV.
Collect and understand the mis-modellings and discrepancies observed.

We need manpower for the yellow report!!

- RIVET and HEP infos: well advanced topic where we aim to set a common strategy (format) about the storage and usage of uncertainty infos (correlations, tables…) across experiments.

advanced

- Jet Substructure: define common strategy on observables, ranges and binning definitions across experiment, collect and improve RIVET routines, measurements

advanced

- Color Flow / Jet Pull

new topics started

- Collective Phenomena in pp/pA

The V+ heavy flavours “mini-workshop”

A series of 3 LHC-EW Jets&EW bosons meetings dedicated to the physics of vector boson in association with heavy flavoured jets (theory+experiments) at LHC

The current schedule of this mini-workshop (4pm, Vidyo-only):

part I	*Monday, March 16th*	https://indico.cern.ch/event/896630/
part II	*Monday, March 30th*	https://indico.cern.ch/event/898125
part III	*Monday, April 6th*	TBC

We will have talks by CMS, ATLAS, LHCb and many theory updates on the V+HF phenomenology… stay tuned!

Why V+HF-jets is interesting for LHC-EW?

Physics of W/Z + heavy flavors at LHC

perturbative QCD

- *Wc :* access the strange quark content of the proton
- *Zb :* understand the production mechanism
  - tree level vs NLO
  - 4FS ($m_b \neq 0$) vs 5FS ($m_b = 0$)
- PDF studies, NLO effects

Electroweak Measurements

- Higgs background *HZ*, *HW*
- Differential Cross sections
- *Zb* polarization asymmetry $\sin^2\Theta_W^{eff}$, couplings

Beyond the Standard Model

- 4th generation heavy *b',t'* quarks decaying to *Vb*
- Multi Higgs-doublets Models
- supersymmetry with *sbottoms*

Why V+HF-jets is interesting for LHC-EW?

How can V+HF measurements fit the LHCEW-Jets&bosons projects?

- Benchmark Comparisons: We can add comparisons on W+b/c,Z+b/c with experiments data and make studies on the different predictions in order to evaluate systematic trends/ behaviour or possible discrepancies. We should define common criteria if we want to do that!

- RIVET status: Again, what we need to start this is RIVET plugins: at the moment, very few measurements have their updated and public RIVET code:

W/Z+HF https://twiki.cern.ch/twiki/bin/view/LHCPhysics/LHCPublicResultsWithJets

Rivet Routine	Process	Data Set	arXiv	Routine status
CMS_2017_I1499471	Z+b(b)	8TeV 2017	1611.06507	public
ATLAS_2014_I1306294	Z+b(b)	7TeV 2011	1407.3643	public
ATLAS_2013_I1219109	W+b	7TeV 2011	1302.2929	public
LHCb	W+b	7,8 TeV 2011,2012	1505.04051	

!!! not even a single 13 TeV measurement yet!

Today's Agenda

LHC-EW WG: Jets and EW bosons

Monday 16 Mar 2020, 16:00 → 17:10 Europe/Zurich

Videoconference Rooms: LHC-EW_WG__Jets_and_EW_bosons — Join

16:00 → 16:10 **Introduction to the V+HF sessions of the LHCEW- Jets & EW bosons group** — 10m
Speaker: Dr Vieri Candelise (Universita e INFN Trieste (IT))

16:10 → 16:40 **Matching uncertainties and choices of the PS scales in Z+bb** — 30m
Speaker: Emanuele Angelo Bagnaschi (Paul Scherrer Institut (CH))

16:40 → 17:10 **V+HF-jets production in ATLAS** — 30m
Speaker: Camilla Vittori (Universita e INFN, Bologna (IT))

Stay Safe!

See you on Monday
March 30th
https://indico.cern.ch/event/898125/