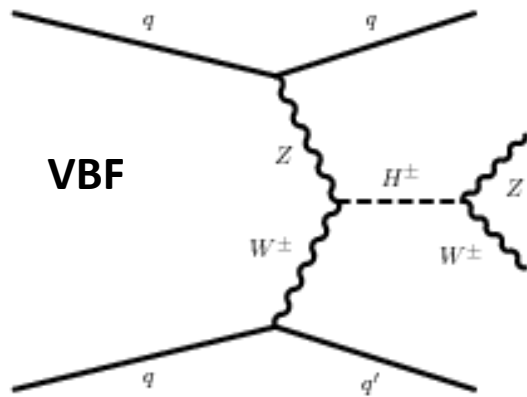
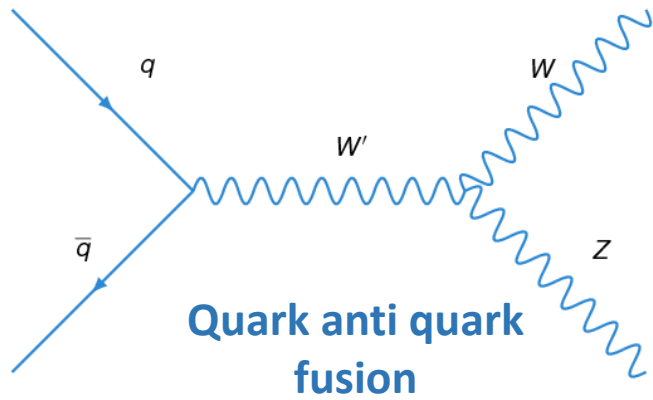


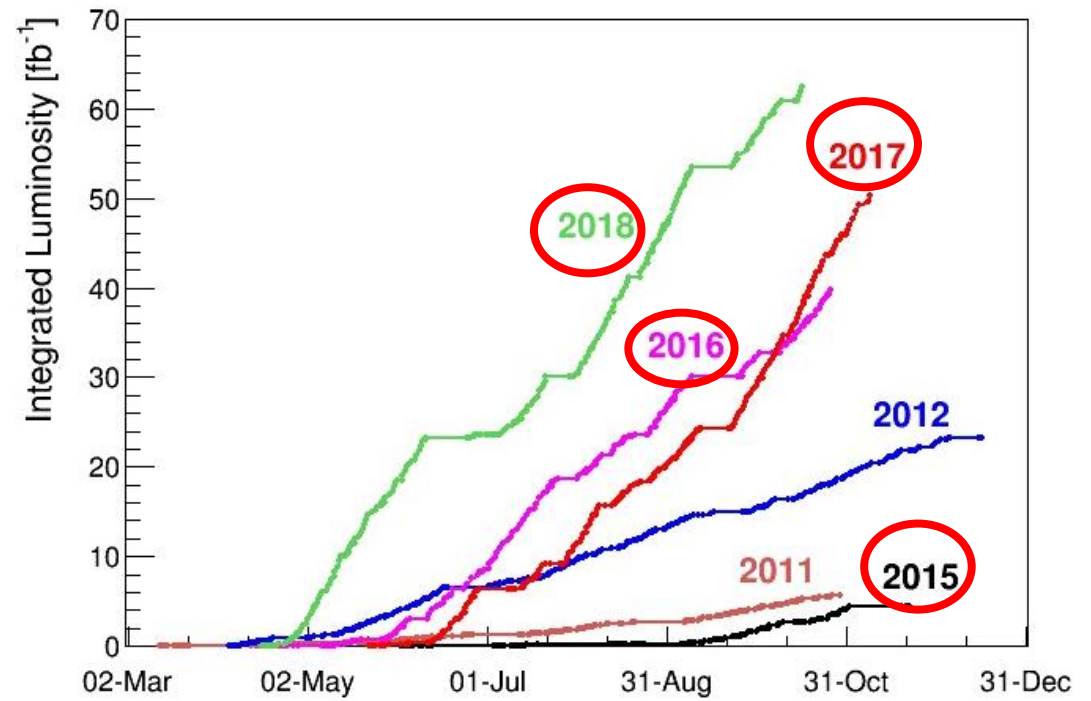
Preparation for $WZlv'l'$ resonant search using the fully Run2 Data

Salah-eddine Dahbi, Samira Hassani, Yahya tayalati.

Introduction:



Run2: $\mathcal{L} = 158 \text{ fb}^{-1}$



Data and MC used for the Cutflow:

Analysis Release 21.

Good Run Lists :

- data15_13TeV.periodAllYear_DetStatus-v89-pro21-02_Unknown_PHYS_StandardGRL_All_Good_25ns.xml
- data16_13TeV.periodAllYear_DetStatus-v89-pro21-01_DQDefects-00-02-04_PHYS_StandardGRL_All_Good_25ns.xml
- data17_13TeV.periodAllYear_DetStatus-v97-pro21-17_Unknown_PHYS_StandardGRL_All_Good_25ns_TriggerNo17e33prim.xml
- data18_13TeV.periodAllYear_DetStatus-v102-pro22-04_Unknown_PHYS_StandardGRL_All_Good_25ns_TriggerNo17e33prim.xml

Monte-Carlo Sample:

- mc16_13TeV.361601.PowhegPy8EG_CT10nloME_AZNLOCTEQ6L1_WZlvll_mll4.deriv.DAOD_HIGG2D1.e4475_s3126_r10201_p3652
 - ✓ DAOD_HIGG2D1.15650384._000021.pool.root.1

Event selection:

	Abhishek/Joany	Miaoran	Marievi	Salah
Start	91726	91726	91726	91726
GRL	91726	91726	91726	91726
larError	91726	91726	91726	91726
Vertex	91726	91726	91726	91726
Trigger	56294	55938	56294	55938

Issue:

- random runN in MC to make it match the data runs we apply the **PileupReweighting**
- we tried two different ways to get the random run numbers:

```
unsigned int RandomRunNumber = evtInfo->auxdecor<unsigned int>("RandomRunNumber");
```

```
unsigned int RandomRunNumber = tool->getRandomRunNumber( *evtInfo );
```

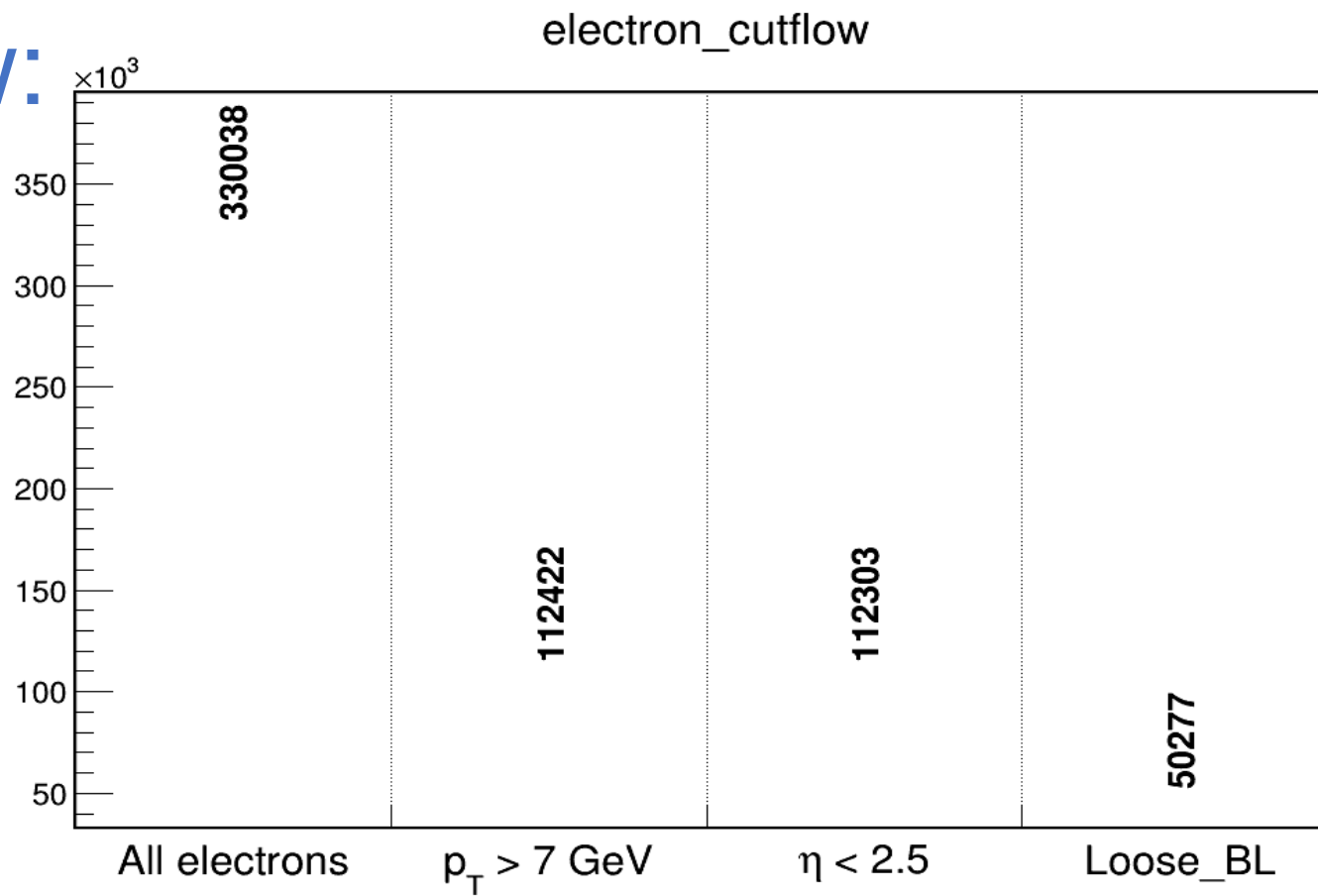
- According to the twiki of the ExtendedPileupReweighting, these two methods should be exactly equal:

<https://twiki.cern.ch/twiki/bin/viewauth/AtlasProtected/ExtendedPileupReweighting>

Example for single muon triggers

```
if(m_RunNum<296939){
muon_trigger1 = "HLT_mu20_loose_L1MU15";
muon_trigger2 = "HLT_mu50";
m_muTMstring= "HLT_mu20_loose_L1MU15_OR_HLT_mu50";
}
if(m_RunNum>=296939 && m_RunNum<300345){
muon_trigger1 = isMC? "HLT_mu24_loose_L1MU15" : "HLT_mu24_loose";
muon_trigger2 = "HLT_mu50";
m_muTMstring=
"HLT_mu24_loose_OR_HLT_mu24_loose_L1MU15_OR_HLT_mu50";
}
if(m_RunNum>=300345 && m_RunNum<302919){
muon_trigger1 = "HLT_mu24_ivarmedium";
muon_trigger2 = "HLT_mu50";
m_muTMstring= "HLT_mu24_ivarmedium_OR_HLT_mu50";
}
if(m_RunNum>=302919){
muon_trigger1 = "HLT_mu26_ivarmedium";
muon_trigger2 = "HLT_mu50";
m_muTMstring= "HLT_mu26_ivarmedium_OR_HLT_mu50";
}
```

Electron cutflow:



	Abhishek/Joany	Miaoran	Marievi	Salah
Electrons	334559	330038	334559	330038
$p_T > 7 \text{ GeV}$	159071		113075	112422
$\eta < 2.5$	112422		112422	112303
Likelihood Loose_BL	50531		50531	50277