Details of the 74X SQL file Summer15_50nsV4

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L1 Pile Up Payloads

- MC payloads created by Andrea Delgado. Retrieved by Alexx Perloff on July 30th, 2015.
- The AK4 PF & PFchs DATA payloads were taken from an email sent by Mikko on August 10th, 2015 at 11:55 am (CST) with the subject "Re: L1Res status." PFall renamed to PF.
- The AK4PFPuppi & AK8 DATA payloads are copies of the AK4PFPuppi & AK8 MC payloads.

Official Recommendation Payloads:

	MC	DATA	#payloads
PF	Summer15_50nsV4_MC_L1FastJet_AK4PF.txt Summer15_50nsV4_MC_L1FastJet_AK8PF.txt	Summer15_50nsV4_DATA_L1FastJet_AK4PF.txt copy of MC	4
PFchs	Summer15_50nsV4_MC_L1FastJet_AK4PFchs.txt Summer15_50nsV4_MC_L1FastJet_AK8PFchs.txt	Summer15_50nsV4_DATA_L1FastJet_AK4PFchs.txt copy of MC	4
PFPuppi	Summer15_50nsV4_MC_L1FastJet_AK4PFPuppi.txt Summer15_50nsV4_MC_L1FastJet_AK8PFPuppi.txt	copy of MC copy of MC	4
Calo	N/A N/A	N/A N/A	0

Total L1: 12 payloads.

L1RC/L1Residual Payloads

NOT IN SQLITE FILE/DATABASE

- L1RC (a.k.a L1RandomCone):
  - Full random cone offset
  - "They are used to derive data/MC SF. This, in turn, is used to scale L1FastJet_MC to produce L1FastJet_DATA" - Ia Iashvili
  - Used for the type-I MET calculations
- The AK4 PF & PFchs DATA payloads were taken from an email sent by Mikko on August 10th, 2015 at 11:55 am (CST) with the subject "Re: L1Res status." PFall renamed to PF.
- The PFPuppi payloads are copies of the PFchs payloads.
- The AK8 payloads are copies of the AK4 payloads.
- In theory it **may be** possible to also have an L1Residual payload where $L1FastJet\_DATA \sim L1FastJet\_MC \times \frac{L1RC\_DATA}{L1RC\_MC}$ such that $L1Residual \sim \frac{L1RC\_DATA}{L1RC\_MC}$
  - In **theory** this would mean that the correction chain would become $L1 \times L1Residual$ (for DATA) $\times L2Relative \times L3Absolute \times L2L3Residual$ (for DATA)
  - In **reality** this is not exactly the precise formulation because L1Residual only scales parameters [1] and [2], but not [0] in the L1FastJet_MC file

	MC	DATA	#payloads
PF	Summer15_50nsV4_MC_L1RC_AK4PF.txt Summer15_50nsV4_MC_L1RC_AK8PF.txt	Summer15_50nsV4_DATA_L1RC_AK4PF.txt Summer15_50nsV4_DATA_L1RC_AK8PF.txt	4
PFchs	Summer15_50nsV4_MC_L1RC_AK4PFchs.txt Summer15_50nsV4_MC_L1RC_AK8PFchs.txt	Summer15_50nsV4_DATA_L1RC_AK4PFchs.txt Summer15_50nsV4_DATA_L1RC_AK8PFchs.txt	4
PFPuppi	Summer15_50nsV4_MC_L1RC_AK4PFPuppi.txt Summer15_50nsV4_MC_L1RC_AK8PFPuppi.txt	Summer15_50nsV4_DATA_L1RC_AK4PFPuppi.txt Summer15_50nsV4_DATA_L1RC_AK8PFPuppi.txt	4
Calo	Empty Empty	Empty Empty	0

Total L1RC: 12 payloads.

L1RC/L1Residual Payloads - continued

NOT IN SQLITE FILE/DATABASE

Why aren't these in the database?

- Simple answer...there is no dedicated payload for either of these "correction levels"
  - The payloads in red do not exist in the official CMSSW code
- It's my understanding that adding these to 76X and then having them backported to 74X and 75X would be difficult
- However, I have never done a pull request that affects both CondFormats and AlCa, so I'm not really sure what the procedure is

CondFormats/JetMETObjects/interface/JetCorrectorParameters.h

```
1  enum Level_t { L1Offset=0, L1JPTOffset=7, L1FastJet = 10, L1Residual=38, L1RC=39, L2Relative=1,
2  L3Absolute=2, L2L3Residual=8, L4EMF=3, L5Flavor=4, L6UE=5, L7Parton=6, Uncertainty=9,
3  UncertaintyAbsolute=11, UncertaintyHighPtExtra=12, UncertaintySinglePionECAL=13,
4  UncertaintySinglePionHCAL=27, UncertaintyFlavor=14, UncertaintyTime=15,
5  UncertaintyRelativeJEREC1=16, UncertaintyRelativeJEREC2=17, UncertaintyRelativeJERHF=18,
6  UncertaintyRelativePtEC1=28, UncertaintyRelativePtEC2=29, UncertaintyRelativePtHF=30,
7  UncertaintyRelativeStatEC2=19, UncertaintyRelativeStatHF=20, UncertaintyRelativeFSR=21,
8  UncertaintyRelativeSample=31, UncertaintyPileUpDataMC=22, UncertaintyPileUpOOT=23,
9  UncertaintyPileUpPtBB=24, UncertaintyPileUpPtEC=32, UncertaintyPileUpPtHF=33,
10 UncertaintyPileUpBias=25, UncertaintyPileUpJetRate=26, UncertaintyAux1=34,
11 UncertaintyAux2=35, UncertaintyAux3=36, UncertaintyAux4=37, N_LEVELS=40 };
```

- I think ideally we'd have $L1 \times L1Residual$ (for DATA) $\times L2Relative \times L3Absolute \times L2L3Residual$ (for DATA) and simply keep L1RC in the database for type-I MET

L2L3 MC-truth Payloads

- Derived over several weeks by Andrea Delgado.
- Picked up by Alexx Perloff on July 30, 2015.
- See Andrea's page for closure and correction plots.
- These were derived on top of the L1's discussed in slide **??**
- Set provided by Andrea was expanded by hand a follows
  - rename files to get rid of endings with "l1" or "l1off" (such as *Calol1off.txt, or *PFl1.txt)
  - create DATA txt which are an exact copy of the MC.
  - create copies for L3Absolute from file L3Absolute_template_txt
    - Same number and jet collections as L2Relative files
    - All return a correction factor of one

	MC	DATA	#payloads
PF	Summer15_50nsV4_MC_L2Relative_AK4PF.txt Summer15_50nsV4_MC_L2Relative_AK8PF.txt	copy of MC copy of MC	4
PFchs	Summer15_50nsV4_MC_L2Relative_AK4PFchs.txt Summer15_50nsV4_MC_L2Relative_AK8PFchs.txt	copy of MC copy of MC	4
PFPuppi	Summer15_50nsV4_MC_L2Relative_AK4PFPuppi.txt Summer15_50nsV4_MC_L2Relative_AK8PFPuppi.txt	copy of MC copy of MC	4
Calo	Empty Empty	Empty Empty	0

Total L2: 12 payloads Total L3: 12 payloads

L2L3Residuals Payloads

- Taken from here on August 13, 2015
- Only the AK4PFchs L2L3Residual file was available so I copied that to all other algorithms in DATA
- I made an L2L3Residual file with a flat correction of 1 for MC and copied that to all algorithms
- This fixed a 2% bug in the L2L3Residuals from Summer15_50nsV3

	MC	DATA	#payloads
PF	Summer15_50nsV4_MC_L2L3Residual_AK4PF.txt Summer15_50nsV4_MC_L2L3Residual_AK8PF.txt	copy of DATA AK4PFchs copy of DATA AK4PFchs	4
PFchs	Summer15_50nsV4_MC_L2L3Residual_AK4PFchs.txt Summer15_50nsV4_MC_L2L3Residual_AK8PFchs.txt	Summer15_50nsV4_DATA_L2L3Residual_AK4PFchs.txt copy of DATA AK4PFchs	4
PFPuppi	Summer15_50nsV4_MC_L2L3Residual_AK4PFPuppi.txt Summer15_50nsV4_MC_L2L3Residual_AK8PFPuppi.txt	copy of DATA AK4PFchs copy of DATA AK4PFchs	4
Calo	Empty Empty	Empty Empty	0

Total L2L3Residuals: 12 payloads.

Uncertainties Payloads

- Taken from here on August 13, 2015
- Only the AK4PFchs Uncertainty and UncertaintySources files were available
- Only copied this to AK4PFchs MC

Uncertainty Payloads:

	MC	DATA	#payloads
PF	Empty Empty	Empty Empty	0
PFchs	copy of DATA Empty	Summer15_50nsV4_DATA_Uncertainty_AK4PFchs.txt Empty	2
PFPuppi	Empty Empty	Empty Empty	0
Calo	Empty Empty	Empty Empty	0

Total Uncertainty: 2 payloads.
Uncertainty Sources: 2 files to be added to twiki

Payload counting

	MC	DATA	Subtotal
L1	6	6	12
L2	6	6	12
L3	6	6	12
Res	6	6	12
Unc	1	1	2
TOTAL	25	25	50

Total Payloads in SQL file: 25 payloads
Plus 2 UncertaintySources file(s) that should go on the twiki page.
Plus 6 L1RC file(s) that should go on the twiki page.