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CMS+TOTEM offline software area

Current version available at: <https://svnweb.cern.ch/cern/wsvn/totem/branches/CMSTotemLowPU2015/>

CMS+TOTEM datasets

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CMS run number	TOTEM run number	CMS LS	Trigger Menu - L1SA	Orbit shift	Comments
Fill 4511			PhysTrig [98]/Totem0(RP_AND&!T2) ; PhysTrig [101]/Totem3(RP_TopTop/BotBot) ; PhysTrig [100]/Totem2 (ZeroBias) ; PhysTrig [96]/DoubleJet32; PhysTrig [97]/DoubleMuOpen; PhysTrig [99]/Totem1_MinBias		
259431	9998	44-->354		11	final nt
259429	9997	213-->308		78	9997_EVB11_1.0-9_ntup
Fill 4510			PhysTrig [98]/Totem0(RP_AND&!T2) ; PhysTrig [101]/Totem3(RP_TopTop/BotBot) ; PhysTrig [100]/Totem2 (ZeroBias) ; PhysTrig [96]/DoubleJet32; PhysTrig [97]/DoubleMuOpen; PhysTrig [99]/Totem1_MinBias		
259399	9980	163-->258		21	9980_EVB11_1.0-9_ntup
	9981	273-->301		33	TotemNTuple_9981.000 Run259399/UABaseTree
	9985	364-->387		77	
	9986	402-->498		88	
	9987	510-->516		100	
	9989	536-->578		122	
Fill 4509			PhysTrig [98]/Totem0(RP_AND&!T2) ; PhysTrig [101]/Totem3(RP_TopTop/BotBot) ; PhysTrig [100]/Totem2 (ZeroBias) ; PhysTrig [96]/DoubleJet32; PhysTrig [97]/DoubleMuOpen; PhysTrig [99]/Totem1_MinBias		
259388	9976	61-->361		43	
	9978	370-->747		66	9978_EVB11_1.0-9_ntup
259385	9959	14-->62			
	9960	69-->106		10	
	9961	110-->132		21	
	9962	133-134		32	
	9964	146-->196		54	
	9971	254-->538		132	9971_EVB11_1.0-9_ntup
259384					Totem triggers?

90m < TOTEM < TWiki

Fill 4505					PhysTrig [98]/Totem0(RP_AND&!T2) ; PhysTrig [101]/Totem3(RP_TopTop/BotBot) ; PhysTrig [100]/Totem2 (ZeroBias) ; PhysTrig [96]/DoubleJet32; PhysTrig [97]/DoubleMuOpen; PhysTrig [99]/Totem1_MinBias
259353					
259352	9940	8-->156		21	9940_EVB11_1.0-9_ntup
	9950	250-->285		137	9950_EVB11_1.0-9_ntup
	9952	301-->316		159	9952_EVB11_1.0-9_ntup
259351					Totem triggers?
Fill 4499 -- 671 b					PhysTrig [98]/Totem0(RP_AND&!T2) ; PhysTrig [101]/Totem3(RP_TopTop/BotBot) ; PhysTrig [100]/Totem2 (ZeroBias) ; PhysTrig [96]/DoubleJet32; PhysTrig [97]/DoubleMuOpen; PhysTrig [99]/Totem1_MinBias
259237	9919	78-->102		133	9919_EVB11_1_ntuple.r
	9920	106-->424		144	final nt
	9922	433-->578		166	final nt
259236					Totem triggers?
Fill 4496 -- 240b					PhysTrig [98]/Totem0(RP_AND&!T2) ; PhysTrig [101]/Totem3(RP_TopTop/BotBot) ; PhysTrig [100]/Totem2 (ZeroBias); PhysTrig [102]/DoubleJet20; PhysTrig [97]/DoubleMuOpen; PhysTrig [99]/Totem1_MinBias ; PhysTrig [103]/L1_MuOpen_NotMinimumBiasHF2_AND
259208	9896(22-)	1-->3			
	9898	23-->144		21	
259207	9895	6-->23		10	
	9896(0-21)	26-->62		22	
259205					Totem triggers?
259202	9893	11-->26		21	
259201					Totem triggers?
259200					Totem triggers?
259199					Totem triggers?
Fill 4495 -- 42b					PhysTrig [98]/Totem0(RP_AND&!T2) ; PhysTrig [101]/Totem3(RP_TopTop/BotBot) ; PhysTrig [100]/Totem2 (ZeroBias); PhysTrig [102]/DoubleJet20; PhysTrig [97]/DoubleMuOpen; PhysTrig [99]/Totem1_MinBias ; PhysTrig [103]/L1_MuOpen_NotMinimumBiasHF2_AND
259167	9883(35-40)	1-->27			
259164	9883(22-35)	All			
259163	9879	1-->10			
	9881	19-->72		22	

9883(0-21)	81-->219	44	9883_EVB11_1.0-9_ntup
259162	9877	5-->66	
259161	9876	8-->16	10
259159			Totem triggers?

CMS datasets

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HLT	L1 seed	CMS ID
HLT_L1DoubleJet20_part0_v1	"L1_DoubleJet20"	ToTOTEM
HLT_L1DoubleJet20_part1_v1	"L1_DoubleJet20"	ToTOTEM
HLT_L1DoubleJet20_part2_v1	"L1_DoubleJet20"	ToTOTEM
HLT_L1DoubleJet20_part3_v1	"L1_DoubleJet20"	ToTOTEM
HLT_L1DoubleJet32_part0_v1	"L1_DoubleJet32"	ToTOTEM
HLT_L1DoubleJet32_part1_v1	"L1_DoubleJet32"	ToTOTEM
HLT_L1DoubleJet32_part2_v1	"L1_DoubleJet32"	ToTOTEM
HLT_L1DoubleJet32_part3_v1	"L1_DoubleJet32"	ToTOTEM
HLT_L1DoubleMuOpen_v1	"L1_DoubleMuOpen"	ToTOTEM
HLT_L1TOTEM1_MinBias_v1	"L1_TOTEM_1"	TOTEM
HLT_L1TOTEM2_ZeroBias_v1	"L1_TOTEM_2"	TOTEM
HLT_L1Muon_NotMinimumBiasHF2AND_v1	"L1_MuOpen_NotMinimumBiasHF2_AND"	HINMu
HLT_L1TOTEM3_RomanPotsTTBB_part0_v1	"L1_TOTEM_3"	TOTEM
HLT_L1TOTEM3_RomanPotsTTBB_part1_v1	"L1_TOTEM_3"	TOTEM
HLT_L1TOTEM3_RomanPotsTTBB_part2_v1	"L1_TOTEM_3"	TOTEM
HLT_L1TOTEM3_RomanPotsTTBB_part3_v1	"L1_TOTEM_3"	TOTEM
HLT_L1TOTEM3_RomanPotsTTBB_part4_v1	"L1_TOTEM_3"	TOTEM
HLT_L1TOTEM3_RomanPotsTTBB_part5_v1	"L1_TOTEM_3"	TOTEM
HLT_L1TOTEM3_RomanPotsTTBB_part6_v1	"L1_TOTEM_3"	TOTEM
HLT_L1TOTEM3_RomanPotsTTBB_part7_v1	"L1_TOTEM_3"	TOTEM
HLT_L1TOTEM0_RomanPotsAND_PixelClusters5_part0_v1	"L1_TOTEM_0"	TOTEM
HLT_L1TOTEM0_RomanPotsAND_PixelClusters5_part1_v1	"L1_TOTEM_0"	TOTEM
HLT_L1TOTEM0_RomanPotsAND_PixelClusters5_part2_v1	"L1_TOTEM_0"	TOTEM
HLT_L1TOTEM0_RomanPotsAND_PixelClusters5_part3_v1	"L1_TOTEM_0"	TOTEM
HLT_L1TOTEM0_RomanPotsAND_PixelClusters5_part4_v1	"L1_TOTEM_0"	TOTEM
HLT_L1TOTEM0_RomanPotsAND_PixelClusters5_part5_v1	"L1_TOTEM_0"	TOTEM
HLT_L1TOTEM0_RomanPotsAND_PixelClusters5_part6_v1	"L1_TOTEM_0"	TOTEM
HLT_L1TOTEM0_RomanPotsAND_PixelClusters5_part7_v1	"L1_TOTEM_0"	TOTEM

Producing CMS UATree ROOT-tuple

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Current version of the UATree code at

<https://svnweb.cern.ch/cern/wsvn/totem/branches/CMSTotemLowPU2015/UATree/>.

Reference CMSSW release: CMSSW_7_4_15

To compile:

```
cd $CMSSW_BASE/src
svn co svn+ssh://svn.cern.ch/repos/totem/branches/CMSTotemLowPU2015/UATree UATree

cd UATree/UADataFormat/
bash dictionary.sh

cd $CMSSW_BASE/src/
scram b -r -j8
```

Example (see

<https://svnweb.cern.ch/cern/wsvn/totem/branches/CMSTotemLowPU2015/CMS-TOTEM-Ntuples/Config/>):

```
from UATree.UABaseTree.UABaseTree_forward_all_cfg import process

process.source.fileNames = [
    '<file 1>',
    '<file 2>',
    ...
]

process.uabasetree.hlt_paths = [
    'HLT_L1DoubleJet20_v1',
    'HLT_L1DoubleJet28_v1',
    'HLT_L1DoubleJet32_v1',
    'HLT_L1DoubleMuOpen_v1',
    'HLT_L1TOTEM1_MinBias_v1',
    'HLT_L1TOTEM2_ZeroBias_v1',
    'HLT_L1TOTEM0_RomanPotsAND_PixelClusters5_part0_v1',
    'HLT_L1TOTEM0_RomanPotsAND_PixelClusters5_part1_v1',
    'HLT_L1TOTEM0_RomanPotsAND_PixelClusters5_part2_v1',
    'HLT_L1TOTEM0_RomanPotsAND_PixelClusters5_part3_v1',
    'HLT_L1TOTEM0_RomanPotsAND_PixelClusters5_part4_v1',
    'HLT_L1TOTEM0_RomanPotsAND_PixelClusters5_part5_v1',
    'HLT_L1TOTEM0_RomanPotsAND_PixelClusters5_part6_v1',
    'HLT_L1TOTEM0_RomanPotsAND_PixelClusters5_part7_v1',
    'HLT_L1TOTEM3_RomanPotsTTBB_part0_v1',
    'HLT_L1TOTEM3_RomanPotsTTBB_part1_v1',
    'HLT_L1TOTEM3_RomanPotsTTBB_part2_v1',
    'HLT_L1TOTEM3_RomanPotsTTBB_part3_v1',
    'HLT_L1TOTEM3_RomanPotsTTBB_part4_v1',
    'HLT_L1TOTEM3_RomanPotsTTBB_part5_v1',
    'HLT_L1TOTEM3_RomanPotsTTBB_part6_v1',
    'HLT_L1TOTEM3_RomanPotsTTBB_part7_v1',
    'HLT_Physics_v1',
    'HLT_Random_v1',
    'HLT_ZeroBias_v1'
]

process.uabasetree.outputfilename = "<output file>"
```

Optionally select events that pass a list of HLT paths:

```
process.load("UATree.UABaseTree.hltFilter_cfi")
```

90m < TOTEM < TWiki

```
process.hlt = process.hltFilter.clone(HLTPaths = ['HLT_L1TOTEM1_MinBias_*'])
process.p.replace(process.uabasetree, process.hlt+process.uabasetree)
```

Writing only metadata

Example (see

<https://svnweb.cern.ch/cern/wsvn/totem/branches/CMSTotemLowPU2015/CMS-TOTEM-Ntuples/Config/>):

```
from UATree.UABaseTree.UABaseTree_forward_metadata_cfg import process

process.source.fileNames = [ '' ]

process.maxEvents.input = -1
# Set Global Tag
process.GlobalTag.globaltag = '74X_dataRun2_Prompt_v2'

process.uabasetree.hlt_paths = [
    'HLT_L1DoubleJet20_v1',
    'HLT_L1DoubleJet28_v1',
    'HLT_L1DoubleJet32_v1',
    'HLT_L1DoubleMuOpen_v1',
    'HLT_L1Muon_NotMinimumBiasHF2AND_v1',
    'HLT_L1TOTEM1_MinBias_v1',
    'HLT_L1TOTEM2_ZeroBias_v1',
    'HLT_L1TOTEM0_RomanPotsAND_PixelClusters5_part0_v1',
    'HLT_L1TOTEM0_RomanPotsAND_PixelClusters5_part1_v1',
    'HLT_L1TOTEM0_RomanPotsAND_PixelClusters5_part2_v1',
    'HLT_L1TOTEM0_RomanPotsAND_PixelClusters5_part3_v1',
    'HLT_L1TOTEM0_RomanPotsAND_PixelClusters5_part4_v1',
    'HLT_L1TOTEM0_RomanPotsAND_PixelClusters5_part5_v1',
    'HLT_L1TOTEM0_RomanPotsAND_PixelClusters5_part6_v1',
    'HLT_L1TOTEM0_RomanPotsAND_PixelClusters5_part7_v1',
    'HLT_L1TOTEM3_RomanPotsTTBB_part0_v1',
    'HLT_L1TOTEM3_RomanPotsTTBB_part1_v1',
    'HLT_L1TOTEM3_RomanPotsTTBB_part2_v1',
    'HLT_L1TOTEM3_RomanPotsTTBB_part3_v1',
    'HLT_L1TOTEM3_RomanPotsTTBB_part4_v1',
    'HLT_L1TOTEM3_RomanPotsTTBB_part5_v1',
    'HLT_L1TOTEM3_RomanPotsTTBB_part6_v1',
    'HLT_L1TOTEM3_RomanPotsTTBB_part7_v1',
    'HLT_Physics_v1',
    'HLT_Random_v1',
    'HLT_ZeroBias_v1'
]

process.uabasetree.outputfilename = "UABaseTree_PromptReco-metadata.root"
```

Final CMS UATree N-tuple

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Fill	CMS run number	CMS dataset name	
4496	259202	--/--	/eos/totem/data/cmstotem/2015
4505	259352	/TOTEM_romanPots2_X/Run2015D-PromptReco-v4/RECO	/eos/totem/data/cmstotem/2015
4505	259351	--/--	/eos/totem/data/cmstotem/2015

90m < TOTEM < TWiki

4499	259237	--/--	/eos/totem/data/cmstotem/2015,
4511	259431	--/--	/eos/totem/data/cmstotem/2015,
4511	259429	--/--	/eos/totem/data/cmstotem/2015,
4510	259399	--/--	/eos/totem/data/cmstotem/2015,
4495	259167	--/--	/eos/totem/data/cmstotem/2015,
4495	259164	--/--	/eos/totem/data/cmstotem/2015,
4495	259163	--/--	/eos/totem/data/cmstotem/2015,
4495	259162	--/--	/eos/totem/data/cmstotem/2015,
4495	259161	--/--	/eos/totem/data/cmstotem/2015,
4509	259388	--/--	/eos/totem/data/cmstotem/2015,
4509	259385	--/--	/eos/totem/data/cmstotem/2015,
4509	259384	--/--	/eos/totem/data/cmstotem/2015,
4496	259208	--/--	/eos/totem/data/cmstotem/2015,
4496	259207	--/--	/eos/totem/data/cmstotem/2015,

The list of luminosity sections processed, in JSON format can be found at:

</afs/cern.ch/work/e/eliza/public/lumis/Run259352/>
</afs/cern.ch/work/e/eliza/public/lumis/Run259237/>
</afs/cern.ch/work/e/eliza/public/lumis/Run259351/>
</afs/cern.ch/work/e/eliza/public/lumis/Run259385/>
/afs/cern.ch/work/k/kshcheli/public/CMSTOTEM/lumiSummary_4511_4510_4495.json
</afs/cern.ch/work/e/ealvesco/public/CMSTOTEM/>

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Fill	CMS run number	CMS dataset name	EOS Path
4511	259431	/TOTEM_minBias_X/Run2015D-PromptReco-v4/RECO	/eos/totem/data/cmstotem/2015/90m/

90m < TOTEM < TWiki

4511	259429	--/--	/eos/totem/data/cmstotem/2015/90m/
4510	259399	--/--	/eos/totem/data/cmstotem/2015/90m/
4495	259167	--/--	/eos/totem/data/cmstotem/2015/90m/
4495	259164	--/--	/eos/totem/data/cmstotem/2015/90m/
4495	259163	--/--	/eos/totem/data/cmstotem/2015/90m/
4495	259162	--/--	/eos/totem/data/cmstotem/2015/90m/
4495	259161	--/--	/eos/totem/data/cmstotem/2015/90m/
4505	259352	--/--	/eos/totem/data/cmstotem/2015/90m/
4499	259237	--/--	/eos/totem/data/cmstotem/2015/90m/
4509	259388	--/--	/eos/totem/data/cmstotem/2015/90m/
4509	259385	--/--	/eos/totem/data/cmstotem/2015/90m/
4509	259384	--/--	/eos/totem/data/cmstotem/2015/90m/
4496	259208	--/--	/eos/totem/data/cmstotem/2015/90m/
4496	259207	--/--	/eos/totem/data/cmstotem/2015/90m/
4496	259202	--/--	/eos/totem/data/cmstotem/2015/90m/

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Fill	CMS run number	CMS dataset name	
4511	259431	/TOTEM_romanPotsTTBB_X/Run2015D-PromptReco-v4/RECO	/eos/totem/data/cmstotem/20
4511	259429	--/--	/eos/totem/data/cmstotem/20
4510	259399	--/--	/eos/totem/data/cmstotem/20
4495	259167	--/--	/eos/totem/data/cmstotem/20
4495	259164	--/--	/eos/totem/data/cmstotem/20

90m < TOTEM < TWiki

4495	259163	--/--	/eos/totem/data/cmstotem/20
4495	259162	--/--	/eos/totem/data/cmstotem/20
4495	259161	--/--	/eos/totem/data/cmstotem/20
4499	259237	--/--	/eos/totem/data/cmstotem/20
4505	259352	--/--	/eos/totem/data/cmstotem/20

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Fill	CMS run number	CMS dataset name	EOS Path
4496	259202	--/--	/eos/totem/data/cmstotem/2015/90m/CMS/EmptyE
4499	259237	/EmptyBX/Run2015D-PromptReco-v4/RECO	/eos/totem/data/cmstotem/2015/90m/CMS/Emp
4505	259352	--/--	/eos/totem/data/cmstotem/2015/90m/CMS/Emp
4511	259431	--/--	/eos/totem/data/cmstotem/2015/90m/CMS/EmptyE
4511	259429	--/--	/eos/totem/data/cmstotem/2015/90m/CMS/EmptyE
4510	259399	--/--	/eos/totem/data/cmstotem/2015/90m/CMS/EmptyE
4495	259167	--/--	/eos/totem/data/cmstotem/2015/90m/CMS/EmptyE
4495	259164	--/--	/eos/totem/data/cmstotem/2015/90m/CMS/EmptyE
4495	259163	--/--	/eos/totem/data/cmstotem/2015/90m/CMS/EmptyE
4495	259162	--/--	/eos/totem/data/cmstotem/2015/90m/CMS/EmptyE
4495	259161	--/--	/eos/totem/data/cmstotem/2015/90m/CMS/EmptyE
4509	259388	--/--	/eos/totem/data/cmstotem/2015/90m/CMS/EmptyE
4509	259385	--/--	/eos/totem/data/cmstotem/2015/90m/CMS/EmptyE
4509	259384	--/--	/eos/totem/data/cmstotem/2015/90m/CMS/EmptyE
4496	259208	--/--	/eos/totem/data/cmstotem/2015/90m/CMS/EmptyE

4496	259207	--/--	/eos/totem/data/cmstotem/2015/90m/CMS/EmptyB
------	--------	-------	--

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Fill	CMS run number	CMS dataset name	EOS Path
4511	259431	/ToTOTEM/Run2015D-PromptReco-v4/RECO	/eos/totem/data/cmstotem/2015/90m/CMS/Mu
4511	259429	--/--	/eos/totem/data/cmstotem/2015/90m/CMS/Mu
4510	259399	--/--	/eos/totem/data/cmstotem/2015/90m/CMS/Mu
4509	259388	--/--	/eos/totem/data/cmstotem/2015/90m/CMS/Mu
4509	259385	--/--	/eos/totem/data/cmstotem/2015/90m/CMS/Mu
4509	259384	--/--	/eos/totem/data/cmstotem/2015/90m/CMS/Mu
4505	259352	--/--	/eos/totem/data/cmstotem/2015/90m/CMS/Mu
4499	259237	--/--	/eos/totem/data/cmstotem/2015/90m/CMS/Mu
4496	259208	--/--	/eos/totem/data/cmstotem/2015/90m/CMS/Mu
4496	259207	--/--	/eos/totem/data/cmstotem/2015/90m/CMS/Mu
4496	259202	--/--	/eos/totem/data/cmstotem/2015/90m/CMS/Mu
4495	259167	--/--	/eos/totem/data/cmstotem/2015/90m/CMS/Mu
4495	259164	--/--	/eos/totem/data/cmstotem/2015/90m/CMS/Mu
4495	259163	--/--	/eos/totem/data/cmstotem/2015/90m/CMS/Mu
4495	259162	--/--	/eos/totem/data/cmstotem/2015/90m/CMS/Mu
4495	259161	--/--	/eos/totem/data/cmstotem/2015/90m/CMS/Mu

Merging CMS+TOTEM ROOT-tuples

Reminder: Totem Orbit Number in data has to be divided by 2

Download tools from:

`svn co svn+ssh://svn.cern.ch/repos/totem/branches/CMSTotemLowPU2015/CMS-TOTEM-Ntuples CMS-TOTEM-Ntuples`

Compile:

```
cd CMS-TOTEM-Ntuples
source setup.csh
cd Merge
make
```

Merging CMS and TOTEM files**(Under construction)**

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```
cd Merge
$PWD/mergeNtuples <TOTEM data file> <CMS data file> <output file> <CMS run number> <offset> [<file type>]

cd Scripts
./createScript.py \
--totemDir=<EOS TOTEM dir> \
--cmsDir=<EOS CMS dir> \
--totemFileType=<TOTEM file type> \
--outputDir=<EOS output dir> \
--cmsRunNumber=<CMS Run number> \
--orbitOffset=<CMS/TOTEM orbit offset> \
--cmsFirstLumi=<CMS first lumi to process> \
--cmsLastLumi=<CMS last lumi to process> \
--submitDir=<Dir. with job definitions>
```

Example:

```
cd Scripts
./createScript.py \
--totemDir=/eos/totem/data/cmstotem/2015/90m/Totem/Ntuple/version1/ \
--cmsDir=/eos/totem/data/cmstotem/2015/90m/CMS/TOTEM_romanPots2_X/Run259352/version_uatree_update \
--totemFileType=9940 \
--outputDir=/eos/totem/data/cmstotem/90m/Totem/CMSTotemLowPU2015/Merge-test/ \
--cmsRunNumber=259352 \
--orbitOffset=21 \
--submitDir=submit-test-v1

cd <submit dir>
./submit.sh
```

Full list of options:

```
./createScript.py -h
Usage: createScript.py [options]
```

Options:

```
-h, --help                show this help message and exit
--totemDir=TOTEMDIR       TOTEM directory
--totemFileType=TYPE      Select files matching TYPE
--cmsDir=CMSDIR           CMS directory
--cmsFileType=TYPE        Select files matching TYPE
--outputDir=OUTPUTDIR     Output directory
--submitDir=SUBMITDIR     Local directory where LSF jobs are defined
--queue=QUEUE             LSF queue name
--cmsRunNumber=CMSRUNNUMBER
                           CMS Run number
--orbitOffset=ORBITOFFSET
                           Orbit offset
--cmsFirstLumi=CMSFIRSTLUMI
                           First CMS lumi section
```

```
--cmsLastLumi=CMSLASTLUMI
      Last CMS lumi section
```

Finding orbit offset

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- Note that the offset can be found with a fraction of the data, as long as the Run periods between the CMS and TOTEM files overlap. If merging files is needed, see below.
- Needed only once:

```
svn co svn+ssh://svn.cern.ch/repos/totem/branches/CMSTotemLowPU2015/CMS-TOTEM-Ntuples CM
cd CMS-TOTEM-Ntuples
source setup.csh
cd Merge
make
```

- Calculate orbit offset. Output log gives calculated orbit offset. Histograms saved in output ROOT file.

```
cd Merge
$PWD/findOrbitOffset <TOTEM data file> <CMS data file> <output file> [<first CMS lumi>]
```

Utilities

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- Needed only once:

```
svn co svn+ssh://svn.cern.ch/repos/totem/branches/CMSTotemLowPU2015/CMS-TOTEM-Ntuples CM
cd CMS-TOTEM-Ntuples
source setup.csh
cd Merge
make
```

- Merging CMS files. Full paths to ROOT files (including EOS path and prefix) assumed. Only event metadata information is saved.

```
cd Merge
$PWD/mergeCMSFiles <Output file name> <CMS data file 1> [<CMS data file 2>,...]
```

- Merging TOTEM files (if needed). Full paths to ROOT files (including EOS path and prefix) assumed. Only event metadata information is saved.

```
cd Merge
$PWD/mergeTOTEMFiles <Output file name> <TOTEM data file 1> [<TOTEM data file 2>,...]
```

- Example:

```
$PWD/mergeTOTEMFiles TOTEM_9836-metadata-v1.root `listFilesEOS.py -d /eos/totem/data/cm
```

- The `listFilesEOS.py` script is available under <https://svnweb.cern.ch/cern/wsvn/totem/branches/CMSTotemLowPU2015/CMS-TOTEM-Ntuples/Scripts/>

CMS+TOTEM merged datasets

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Totem Datasets: /eos/totem/data/cmstotem/2015/90m/Totem/Ntuple/version2/<fill_number>

Warning for RUNs 9920 9940 9950 9976 9985 9998: use

/eos/totem/data/cmstotem/2015/90m/Totem/Ntuple/v_resynch/<fill_number>

CMS Datasets: /eos/totem/data/cmstotem/2015/90m/CMS/TOTEM_romanPots2_X/RunXXX/

Fill	CMS run number	TOTEM run number	EOS Path (Merged)	Comments
4511	259431	9998 (*)	/eos/totem/data/cmstotem/2015/90m/Merged/4511/9998	produced by Vale
4511	259429	9997	/eos/totem/data/cmstotem/2015/90m/Merged/4511/9997	produced by Vale
4510	259399	9980,9981,9986,9987,9989	/eos/totem/data/cmstotem/2015/90m/Merged/4510	produced by Robert
4510	259399	9985(*)	/eos/totem/data/cmstotem/2015/90m/Merged/4510/9985	produced by Vale
4509	259388	9978	/eos/totem/data/cmstotem/2015/90m/Merged/4509	produced by Vale
4509	259388	9976 (*)	/eos/totem/data/cmstotem/2015/90m/Merged/4509/9976	produced by Vale
4509	259385	9960,9961,9962	/eos/totem/data/cmstotem/2015/90m/Merged/4509	produced by Vale
4509	259385	9971	/eos/totem/data/cmstotem/2015/90m/Merged/4509/9971	produced by Vale
4509	259385	9964	/eos/totem/data/cmstotem/2015/90m/Merged/4509/9964	produced by Robert
4505	259352	9952	/eos/totem/data/cmstotem/2015/90m/Merged/4505/9952	produced by Hubert
4505	259352	9950	/eos/totem/data/cmstotem/2015/90m/Merged/4505/9950	produced by Vale
4505	259352	9940	/eos/totem/data/cmstotem/2015/90m/Merged/4505/9940	produced by Vale
4499	259237	9920 (*)	/eos/totem/data/cmstotem/2015/90m/Merged/4499/9920	produced by Vale
4499	259237	9919,9922	/eos/totem/data/cmstotem/2015/90m/Merged/4499	produced by Vale
4496	259208	9898	/eos/totem/data/cmstotem/2015/90m/Merged/4496	produced by Robert
4496	259207	9895,9896	/eos/totem/data/cmstotem/2015/90m/Merged/4496	produced by Robert

90m < TOTEM < TWiki

4496	259202	9893	/eos/totem/data/cmstotem/2015/90m/Merged/4496	produced by Robert
------	--------	------	---	--------------------

4495	259163	9883	/eos/totem/data/cmstotem/2015/90m/Merged/4495	produced by Robert
------	--------	------	---	--------------------

(*) = Track reconstruction optimized with RP210.; Datasets in eos/totem/data/cmstotem/2015/90m/Totem/Ntuple/v_resynch/<fill_number>

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Totem Datasets: /eos/totem/data/cmstotem/2015/90m/Totem/Ntuple/version2/<fill_number>

Warning for RUNs 9920 9940 9950 9976 9985 9998: use

/eos/totem/data/cmstotem/2015/90m/Totem/Ntuple/v_resynch/<fill_number>

CMS Datasets: /eos/totem/data/cmstotem/2015/90m/CMS/TOTEM_romanPots2_X_rereco/ (UATrees)
from RECO files: /eos/totem/data/cmstotem/2015/90m/CMS/RECO/TOTEM_romanPots2_X/

Fill	CMS run number	TOTEM run number	EOS Path (ReReco)	Comments
4511	259431	9998 (*)	/eos/totem/data/cmstotem/2015/90m/Merged_rereco/4511/	produced by Robert
4511	259429	9997	/eos/totem/data/cmstotem/2015/90m/Merged_rereco/4511/	produced by Robert
4510	259399	9980,9981,9985(*),9986,9987,9989	/eos/totem/data/cmstotem/2015/90m/Merged_rereco/4510/	produced by Robert
4509	259388	9976 (*),9978	/eos/totem/data/cmstotem/2015/90m/Merged_rereco/4509/	produced by Robert
4509	259385	9960,9961,9962,9964,9971	/eos/totem/data/cmstotem/2015/90m/Merged_rereco/4509/	produced by Robert
4505	259352	9940 (), 9950 (), 9952	/eos/totem/data/cmstotem/2015/90m/Merged_rereco/4505/	produced by Robert
4499	259237	9919,9920 (*), 9922	/eos/totem/data/cmstotem/2015/90m/Merged_rereco/4499/	produced by Robert

(*) = Track reconstruction optimized with RP210.; Datasets in eos/totem/data/cmstotem/2015/90m/Totem/Ntuple/v_resynch/<fill_number>

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Totem Datasets: /eos/totem/data/cmstotem/2015/90m/Totem/Ntuple/version2/<fill_number>

() Warning for RUNs 9920 9940 9950 9976 9985 9998: use

/eos/totem/data/cmstotem/2015/90m/Totem/Ntuple/v_resynch/<fill_number>

CMS Datasets: /eos/totem/data/cmstotem/2015/90m/CMS/ZeroBias/RunXXX/

Fill	CMS run	TOTEM run number	EOS Path (MergedZB)	Comments
------	---------	------------------	---------------------	----------

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		number			
4511	259431	9998 (*)	/eos/totem/data/cmstotem/2015/90m/MergedZB/4511/	produced	Robert
4511	259429	9997	/eos/totem/data/cmstotem/2015/90m/MergedZB/4511/	produced	Robert
4510	259399	9980,9981,9985(*),9986,9987,9989	/eos/totem/data/cmstotem/2015/90m/MergedZB/4510/	produced	Robert
4509	259388	9976 (*),9978	/eos/totem/data/cmstotem/2015/90m/MergedZB/4509/	produced	Robert
4509	259385	9960,9961,9962,9964,9971	/eos/totem/data/cmstotem/2015/90m/MergedZB/4509/	produced	Robert
4505	259352	9940 (), 9950 (), 9952	/eos/totem/data/cmstotem/2015/90m/MergedZB/4505/	produced	Robert
4499	259237	9919,9920(*), 9922	/eos/totem/data/cmstotem/2015/90m/MergedZB/4499/	produced	Robert
4496	259208	9898	/eos/totem/data/cmstotem/2015/90m/MergedZB/4496	produced	Robert
4496	259207	9895,9896	/eos/totem/data/cmstotem/2015/90m/MergedZB/4496	produced	Robert
4496	259202	9893	/eos/totem/data/cmstotem/2015/90m/MergedZB/4496	produced	Robert
4495	259163	9881, 9883	/eos/totem/data/cmstotem/2015/90m/MergedZB/4495	produced	Robert

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Totem Datasets: /eos/totem/data/cmstotem/2015/90m/Totem/Ntuple/version2/<fill_number>

() **Warning for RUNs 9920 9940 9950 9976 9985 9998:** use

/eos/totem/data/cmstotem/2015/90m/Totem/Ntuple/v_resynch/<fill_number>

CMS Datasets: /eos/totem/data/cmstotem/2015/90m/CMS/Muons/RunXXX/

Fill	CMS run number	TOTEM run number	EOS Path (MergedMu)	Comme
4511	259431	9998 (*)	/eos/totem/data/cmstotem/2015/90m/MergedMu/4511/	produced Robert
4511	259429	9997	/eos/totem/data/cmstotem/2015/90m/MergedMu/4511/	produced Robert
4510	259399	9980,9981,9985(*),9986,9987,9989	/eos/totem/data/cmstotem/2015/90m/MergedMu/4510/	produced Robert

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4509	259388	9976 (*),9978	/eos/totem/data/cmstotem/2015/90m/MergedMu/4509/	produced Robert
4509	259385	9960,9961,9962,9964,9971	/eos/totem/data/cmstotem/2015/90m/MergedMu/4509/	produced Robert
4505	259352	9940 (), 9950 (), 9952	/eos/totem/data/cmstotem/2015/90m/MergedMu/4505/	produced Robert
4499	259237	9919,9920 (*), 9922	/eos/totem/data/cmstotem/2015/90m/MergedMu/4499/	produced Robert
4496	259208	9898	/eos/totem/data/cmstotem/2015/90m/MergedMu/4496	produced Robert
4496	259207	9895,9896	/eos/totem/data/cmstotem/2015/90m/MergedMu/4496	produced Robert
4496	259202	9893	/eos/totem/data/cmstotem/2015/90m/MergedMu/4496	produced Robert
4495	259163	9881, 9883	/eos/totem/data/cmstotem/2015/90m/MergedMu/4495	produced Robert

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Totem Datasets: /eos/totem/data/cmstotem/2015/90m/Totem/Ntuple/version2/<fill_number>

() **Warning for RUNs 9920 9940 9950 9976 9985 9998:** use

/eos/totem/data/cmstotem/2015/90m/Totem/Ntuple/v_resynch/<fill_number>

CMS Datasets: /eos/totem/data/cmstotem/2015/90m/CMS/TOTEM_romanPots2_X/RunXXX/

Fill	CMS run number	TOTEM run number	EOS Path (MergedMu)	Comments
4509	259388	9978	/eos/totem/data/cmstotem/2015/90m/Merged2trkColl/4509/	produced by Robert
4509	259385	9962,9971	/eos/totem/data/cmstotem/2015/90m/Merged2trkColl/4509/	produced by Robert

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Totem Datasets: /eos/totem/data/cmstotem/2015/90m/Totem/Ntuple/version2/<fill_number>

() **Warning for RUNs 9920 9940 9950 9976 9985 9998:** use

/eos/totem/data/cmstotem/2015/90m/Totem/Ntuple/v_resynch/<fill_number>

CMS Datasets: /eos/totem/data/cmstotem/2015/90m/CMS/DoubleJet32/RunXXX/

Fill	CMS run number	TOTEM run number	EOS Path (MergedReRecoJets)	
4499	259237	9919,9920(*), 9922	/eos/totem/data/cmstotem/2015/90m/MergedReRecoJets/4499	p R
4496	259208	9898	/eos/totem/data/cmstotem/2015/90m/MergedReRecoJets/4496	

4496	259207	9895,9896	/eos/totem/data/cmstotem/2015/90m/MergedReRecoJets/4496
4496	259202	9893	/eos/totem/data/cmstotem/2015/90m/MergedReRecoJets/4496
4495	259163	9881, 9883	/eos/totem/data/cmstotem/2015/90m/MergedReRecoJets/4495
4505	259352	9940 (), 9950 (), 9952	/eos/totem/data/cmstotem/2015/90m/MergedReRecoJets/4505/
4509	259385	9960,9961,9962,9964,9971	/eos/totem/data/cmstotem/2015/90m/MergedReRecoJets/4509/
4509	259388	9976 (*),9978	/eos/totem/data/cmstotem/2015/90m/MergedReRecoJets/4509/
4510	259399	9980,9981,9985(*),9986,9987,9989	/eos/totem/data/cmstotem/2015/90m/MergedReRecoJets/4510/
4511	259431	9998 (*)	/eos/totem/data/cmstotem/2015/90m/MergedReRecoJets/4511/
4511	259429	9997	/eos/totem/data/cmstotem/2015/90m/MergedReRecoJets/4511/

Description of TOTEM analysis branches

T1 is off; T2 is only in trigger but not in data; the trigger bit of T2 and T2_quarter can be used to determine the gap.

Description of the TOTEM ntuple structure.

Description of CMS analysis branches

Description of CMS algorithm triggers in 90m runs

Description of TOTEM Trigger bits

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
CMS	RP220	T2&	(RP220	L1SA	T2	BX	T2	T2	T2	T2	CMS	RP220	RP220	RP220	RP220
	V &	CMS	H or		Minus	Plus	Minus	Plus	Plus	&	TopTop	RP220	Cross	Horiz	Vert
	! T2		RP220		Far	Near	Near	Far	L1SA	/					
			V) &				(dead)						BotBot		
			CMS												

Bit 14 --> L1_TOTEM0; Bit 3 --> L1_TOTEM3; Bit 6 --> L1_TOTEM1; Bit 9 --> L1_TOTEM2

-- ValentinaAvati - 2015-10-20

90m < TOTEM < TWiki

This topic: TOTEM > 90m

Topic revision: r66 - 2017-01-23 - RobertCiesielski



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