

学习汇报

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preselection

ATLAS DRAFT

Preselection of low E_T^{miss} SR	Preselection of high E_T^{miss} SR
≥ 2 medium taus	
b-jet veto	
Z/H-veto ($m(\tau_1, \tau_2) > 120$ GeV) (only for OS channel)	
asymmetric di-tau trigger	di-tau+ E_T^{miss} trigger
$E_T^{\text{miss}} < 150$ GeV	$E_T^{\text{miss}} > 150$ GeV
τ_1 and τ_2 p_T requirements described in Table 8 in Section 4.3	

Table 20: Preselection before low and high E_T^{miss} SR optimization for both C1C1 and C1N2

Definition

SR-C1C1-LM
≥ 2 medium taus (OS)
≥ 1 tight tau
b - jet veto
Z/H veto ($m(\tau_1, \tau_2) > 120$ GeV)
$ \Delta\phi(\tau_1, \tau_2) > 1.6$
$E_T^{\text{miss}} > 60$ GeV
$m_{T2} > 80$ GeV
asymmetry di-tau Trigger
$E_T^{\text{miss}} < 150$ GeV
τ_1 and τ_2 p_T requirements

preselection

```
auto mCutflow_low = addCutflow();
mCutflow_low->setWeight([&]{return Var["totalWeight"];});
mCutflow_low->setFillTree(oTree);
mCutflow_low->registerCut("baseline", [&]{return fabs(Var["totalWeight"]) < 1000; }); //统计没有经过任何cut时的事例数
mCutflow_low->registerCut("==2 tau", [&]{return n_BaseTau == 2; });
mCutflow_low->registerCut(">= 2 medium tau", [&]{return nTaus >= 2 && nTightTau >=1; });
mCutflow_low->registerCut("OS", [&]{return (OS2Tau); });
mCutflow_low->registerCut("MET<150 GeV", [&]{return Var["MET"] < 150; });
mCutflow_low->registerCut("z/hVeto(120Gev)", [&]{return Var["Mtt_12"] > 120; });
mCutflow_low->registerCut("bVeto", [&]{return Var["bVeto"];}, "bTag", 2, 0, 2, [&]{return Var["bNumber"];});
// mCutflow_low->registerCut("dPhitt>1.6", [&]{return Var["dPhitt"] > 1.6; }, "dPhitt", 15, 0, 3, [&]{return Var["dPhitt"];}, Hist::USE_OVERFLOW);
// mCutflow_low->registerCut("MET>60 GeV", [&]{return Var["MET"] > 60 && Var["MET"] < 150; }, "MET", 15, 0, 150, [&]{return Var["MET"];}, Hist::USE_OVERFLOW);
// mCutflow_low->registerCut("MT2>80 GeV", [&]{return Var["MT2"] > 80; }, "MT2", 12, 30, 150, [&]{return Var["MT2"];}, Hist::USE_OVERFLOW);
auto lowCut = mCutflow_low->registerCut("the END", [&]{return true; });
lowCut->addHist("MET_low", 18, 0, 180, [&]{return Var["MET"];}, Hist::USE_OVERFLOW);
lowCut->addHist("MT2_low", 20, 0, 200, [&]{return Var["MT2"];}, Hist::USE_OVERFLOW);
lowCut->addHist("tau1Pt_low", 35, 0, 700, [&]{return Var["tau1Pt"];}, Hist::USE_OVERFLOW);
lowCut->addHist("tau2Pt_low", 20, 0, 400, [&]{return Var["tau2Pt"];}, Hist::USE_OVERFLOW);
lowCut->addHist("tau1Mt_low", 50, 0, 600, [&]{return Var["tau1Mt"];}, Hist::USE_OVERFLOW);
lowCut->addHist("tau2Mt_low", 50, 0, 500, [&]{return Var["tau2Mt"];}, Hist::USE_OVERFLOW);
lowCut->addHist("dPhitt_low", 17, 0, 3.4, [&]{return Var["dPhitt"];}, Hist::USE_OVERFLOW);
lowCut->addHist("dRtt_low", 30, 0, 6, [&]{return Var["dRtt"];}, Hist::USE_OVERFLOW);
lowCut->addHist("Mtt_12_low", 50, 0, 1000, [&]{return Var["Mtt_12"];}, Hist::USE_OVERFLOW);
```

preselection

- 清空build, Make, cmake, source subJOB.h
- 合并root文件, 查看root

```
jobs:0 /publicis/atlas/atlasnew/SUSY/users/cuiyan/training/1_Preselelction/run
[08:24 cuiyan@lxslc710 cuiyan]$ root Z.root

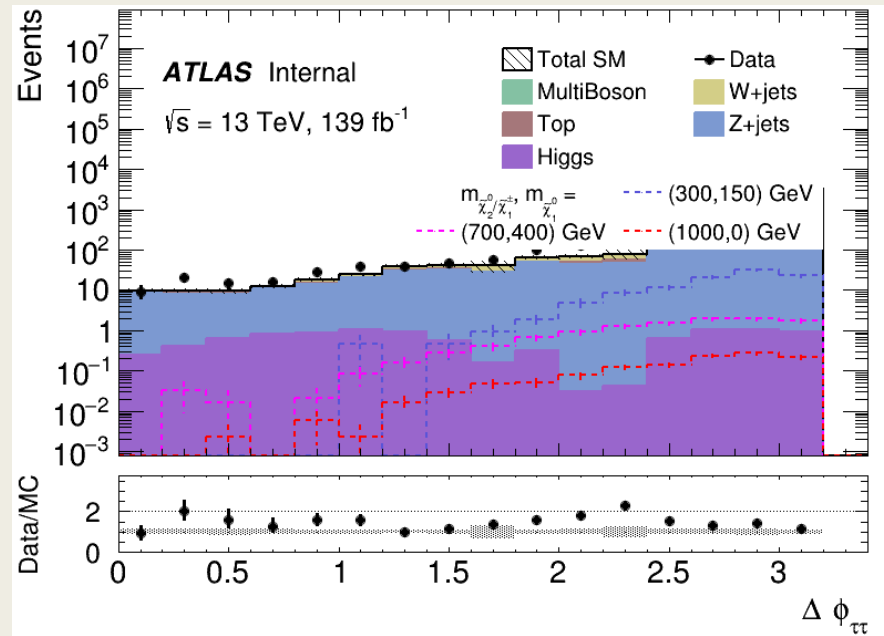
-----
Welcome to ROOT 6.22/00                                     https://root.cern
(c) 1995-2020, The ROOT Team; conception: R. Brun, F. Rademakers
Built for linuxx86_64gcc on Jun 14 2020, 15:54:05
From tags/v6-22-00@v6-22-00
Try '.help', '.demo', '.license', '.credits', '.quit'/'.'
-----

root [0]
Attaching file Z.root as _file0...
(TFile *) 0x4866600
root [1] .ls
TFile**      Z.root
TFile*      Z.root
KEY: TTree   Staus_Nominal;1 SmallTree for fast analysis
KEY: TH1F    bTag;1   bTag
KEY: TH1F    bTag_N_1;1   bTag_N_1
KEY: TH1F    MET_low;1   MET_low
KEY: TH1F    MT2_low;1   MT2_low
KEY: TH1F    tau1Pt_low;1   tau1Pt_low
KEY: TH1F    tau2Pt_low;1   tau2Pt_low
KEY: TH1F    tau1Mt_low;1   tau1Mt_low
KEY: TH1F    tau2Mt_low;1   tau2Mt_low
KEY: TH1F    dPhitt_low;1   dPhitt_low
KEY: TH1F    dRtt_low;1   dRtt_low
KEY: TH1F    Mtt_l2_low;1   Mtt_l2_low
```

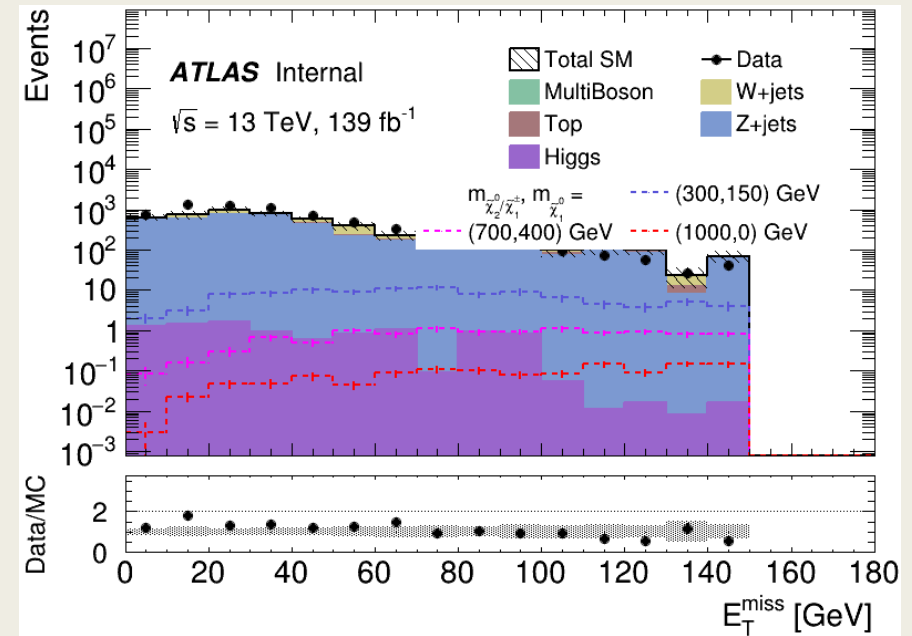
preselection

■ `root -l -b -q 'draw.C("MET_low")'`

dPhitt_low.png

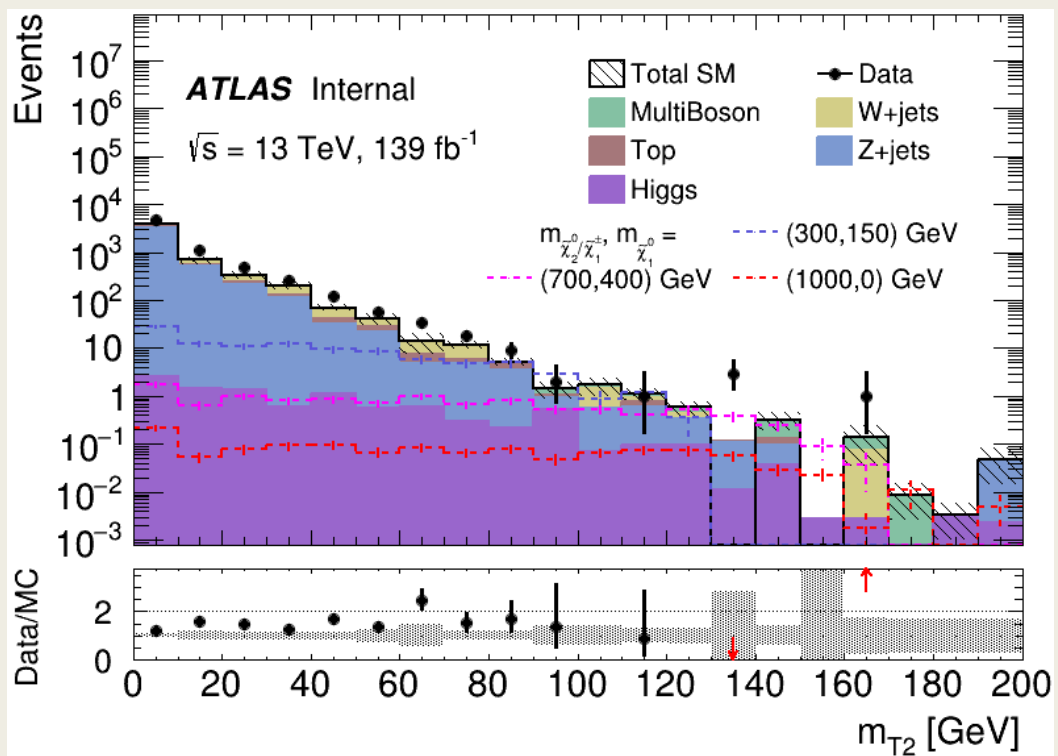


MET_low.png

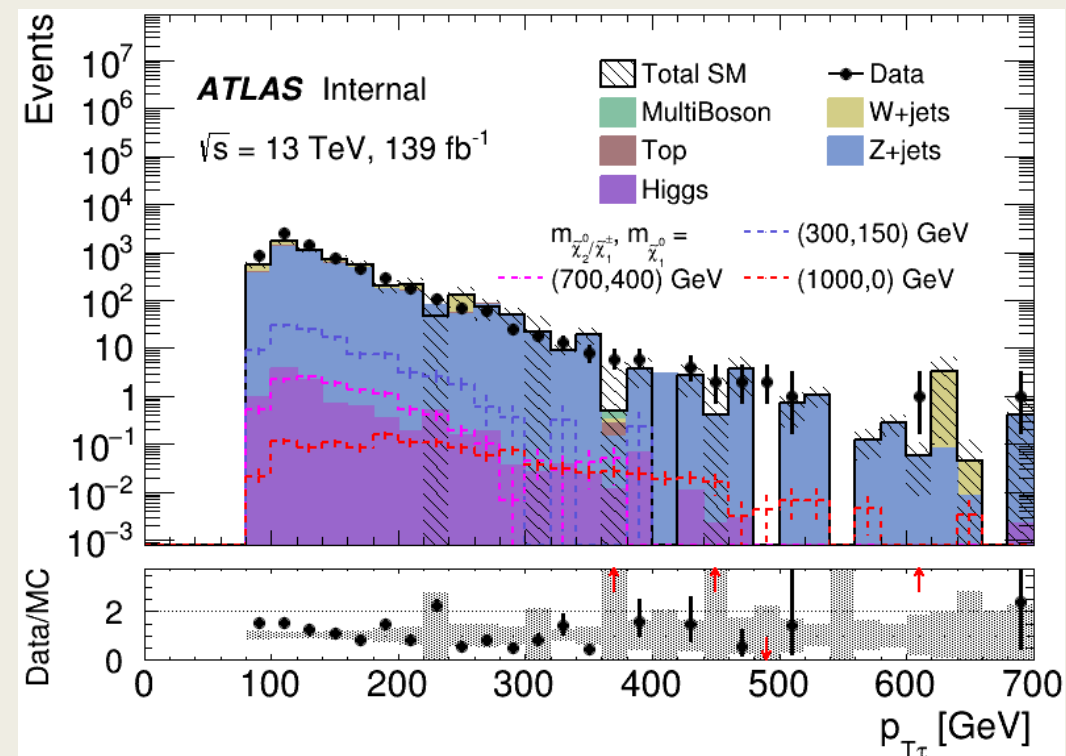


preselection

MT2_low.png



tau1Pt_low.png

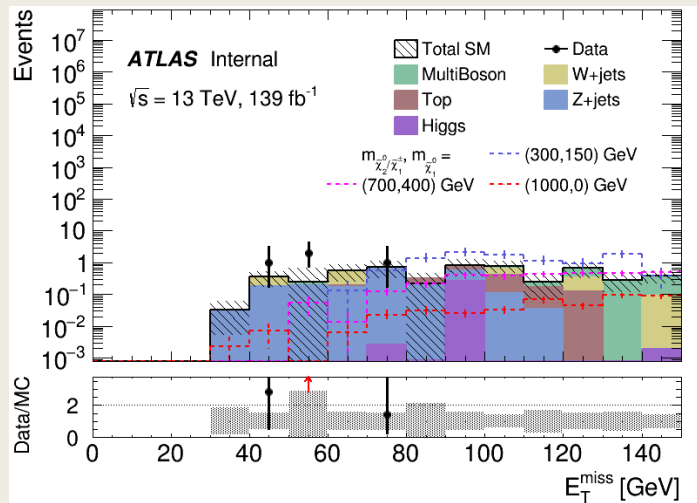


Signal Region

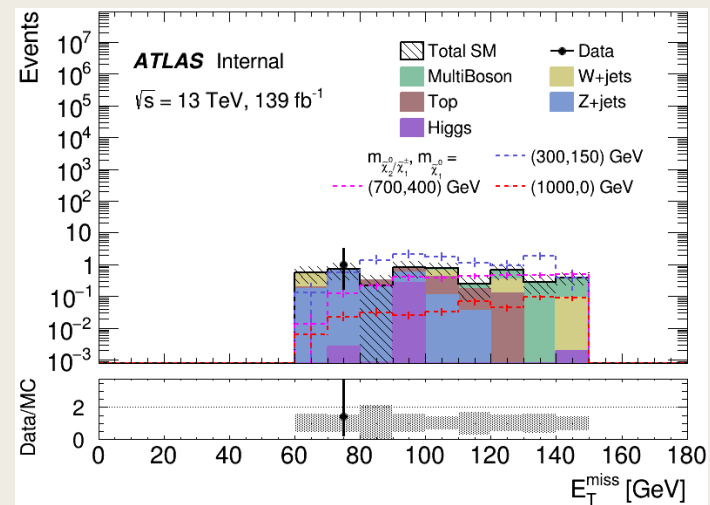
```
[09:05 cuiyan@1xslc710 cuiyan]$ root Z.root
-----
Welcome to ROOT 6.22/00                                     https://root.cern
(c) 1995-2020. The ROOT Team; conception: R. Brun, F. Rademakers
Built for linuxx8664gcc on Jun 14 2020, 15:54:05
From tags/v6-22-00@v6-22-00
Try '.help', '.demo', '.license', '.credits', '.quit'/.q'
-----

root [0]
Attaching file Z.root as _file0...
(TFile *) 0x351b320
root [1] .ls
TFile**      Z.root
TFile*       Z.root
KEY: TTree   Staus_Nominal;1 SmallTree for fast analysis
KEY: TH1F    bTag;1 bTag
KEY: TH1F    bTag_N_1;1 bTag_N_1
KEY: TH1F    dPhitt;1 dPhitt
KEY: TH1F    dPhitt_N_1;1 dPhitt_N_1
KEY: TH1F    MET;1 MET
KEY: TH1F    MET_N_1;1 MET_N_1
KEY: TH1F    MT2;1 MT2
KEY: TH1F    MT2_N_1;1 MT2_N_1
KEY: TH1F    MET_low;1 MET_low
KEY: TH1F    MT2_low;1 MT2_low
KEY: TH1F    tau1Pt_low;1 tau1Pt_low
KEY: TH1F    tau2Pt_low;1 tau2Pt_low
KEY: TH1F    tau1Mt_low;1 tau1Mt_low
KEY: TH1F    tau2Mt_low;1 tau2Mt_low
KEY: TH1F    dPhitt_low;1 dPhitt_low
KEY: TH1F    dRtt_low;1 dRtt_low
KEY: TH1F    Mtt_l2_low;1 Mtt_l2_low
```

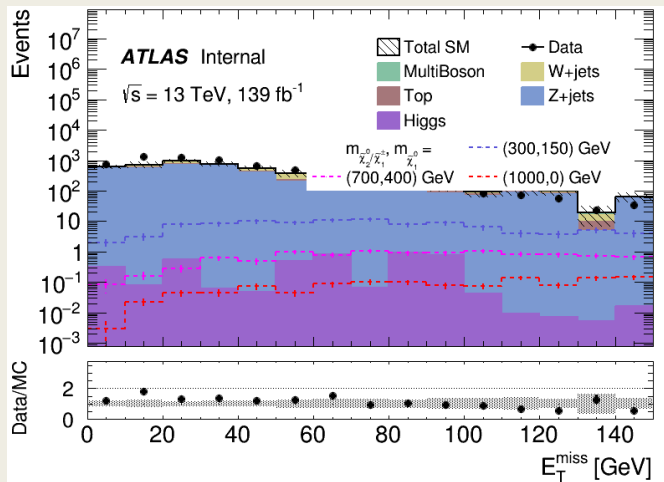
MET_N_1



MET_low

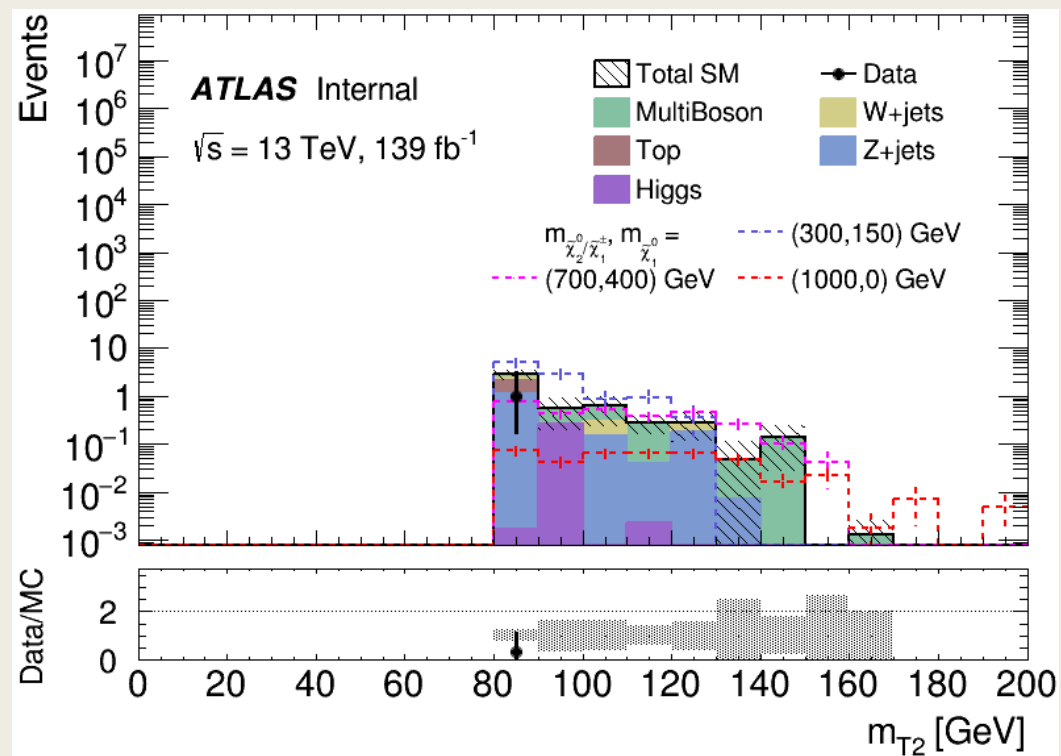


MET

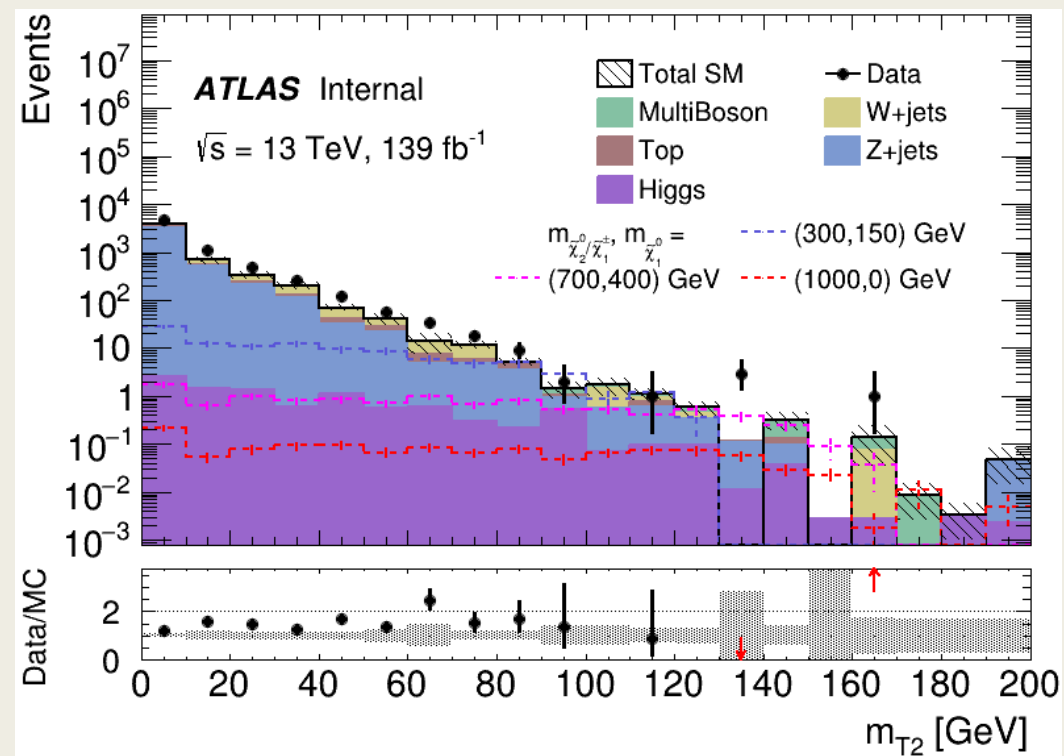


$$m_{T2} > 80 \text{ GeV}$$

SR



pre



Thanks for watching !