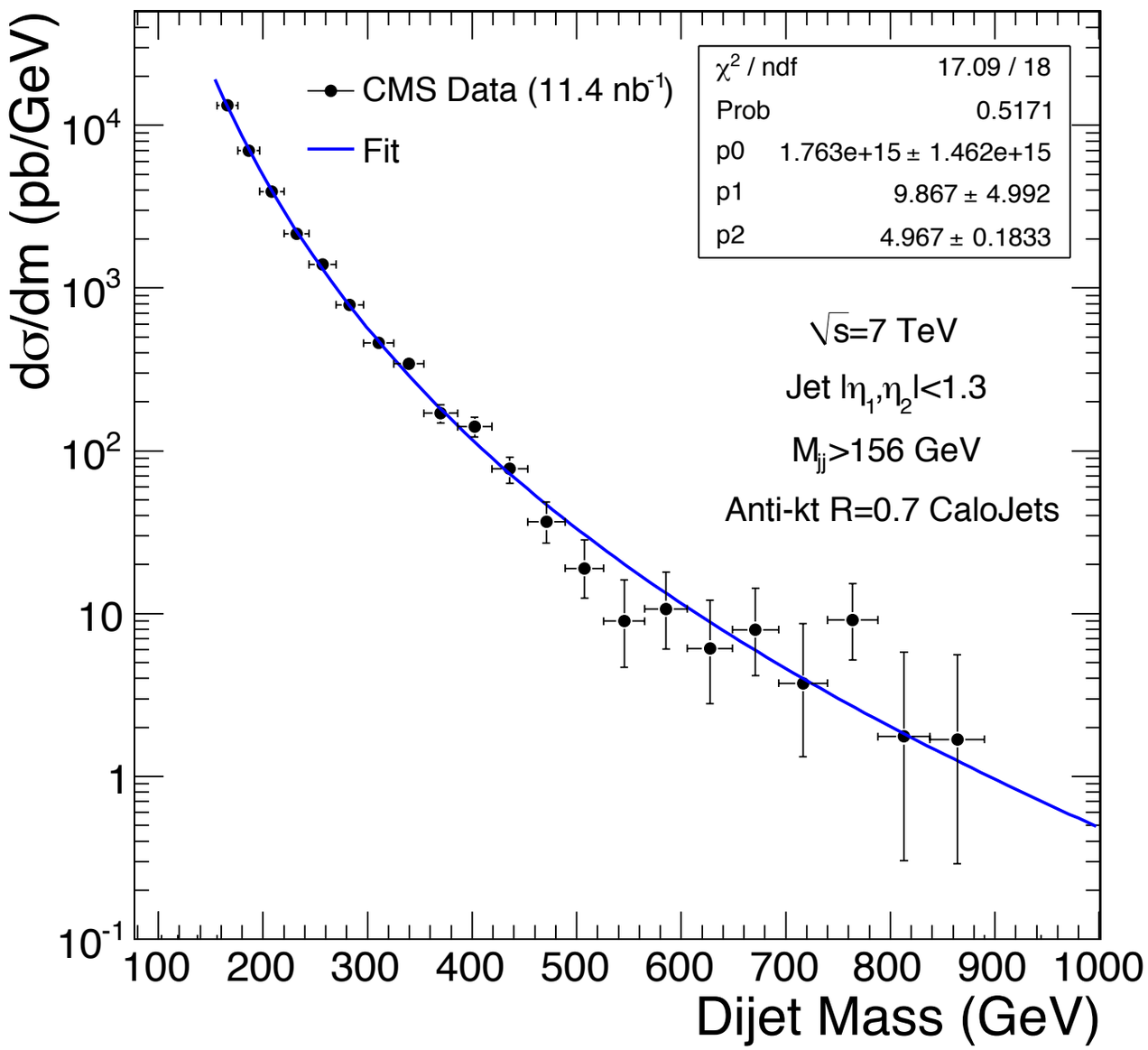
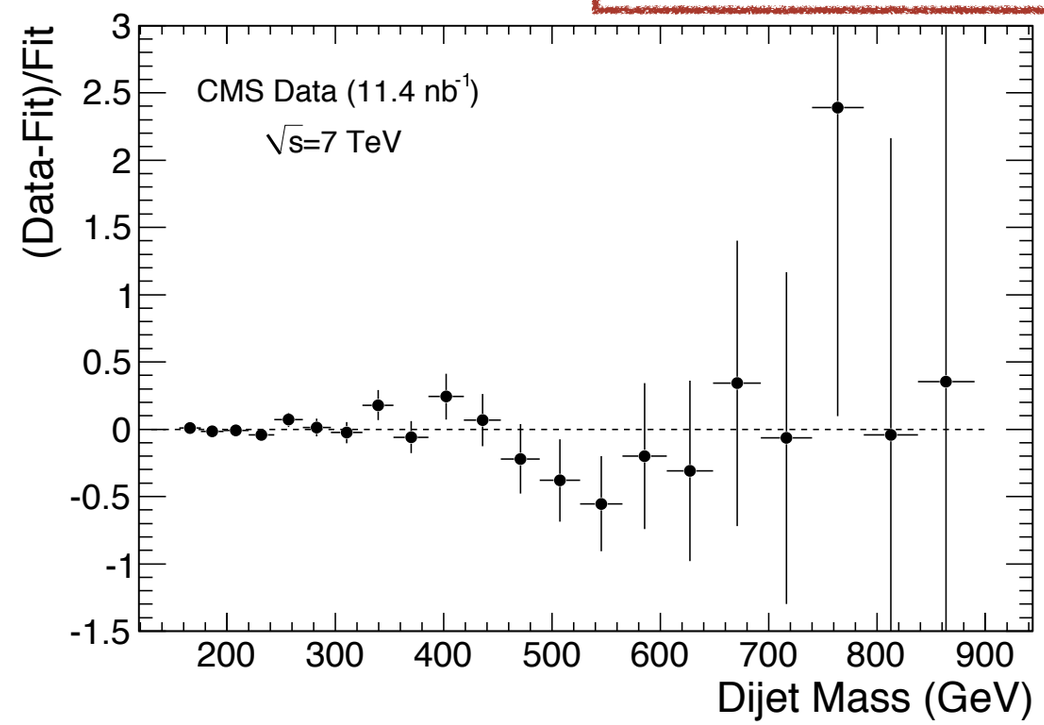
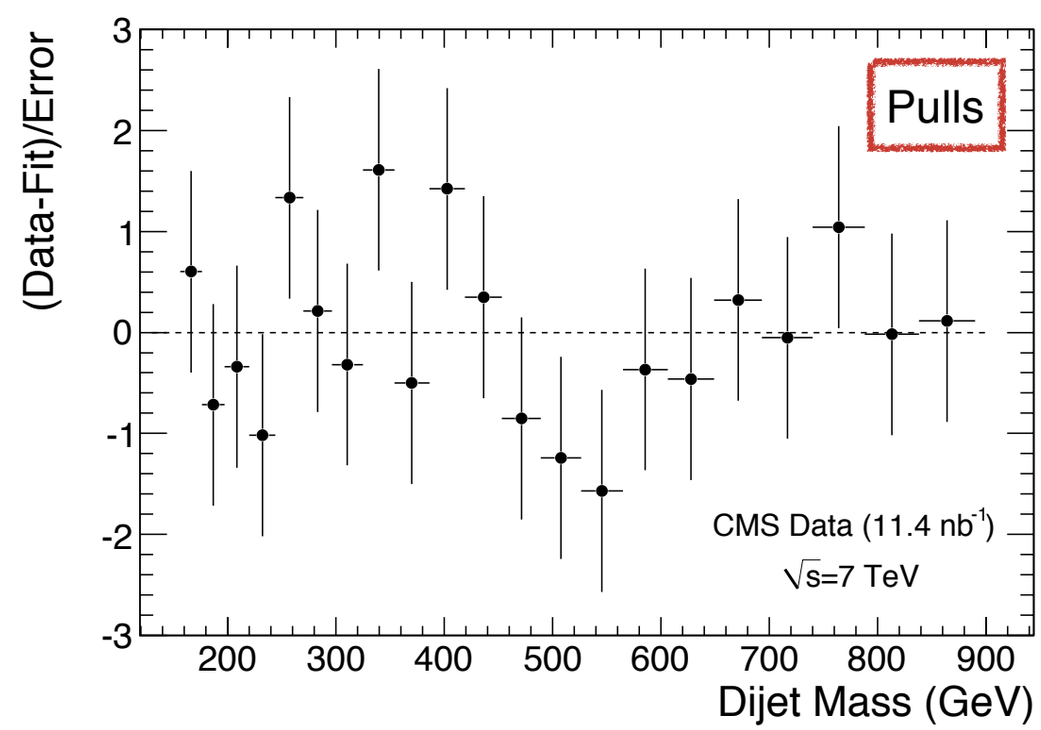
Dijet Mass and Fit

- We fit the data with the function with 3 parameters.
- We get a good fit.



Fractional Diff. between Data and Fit

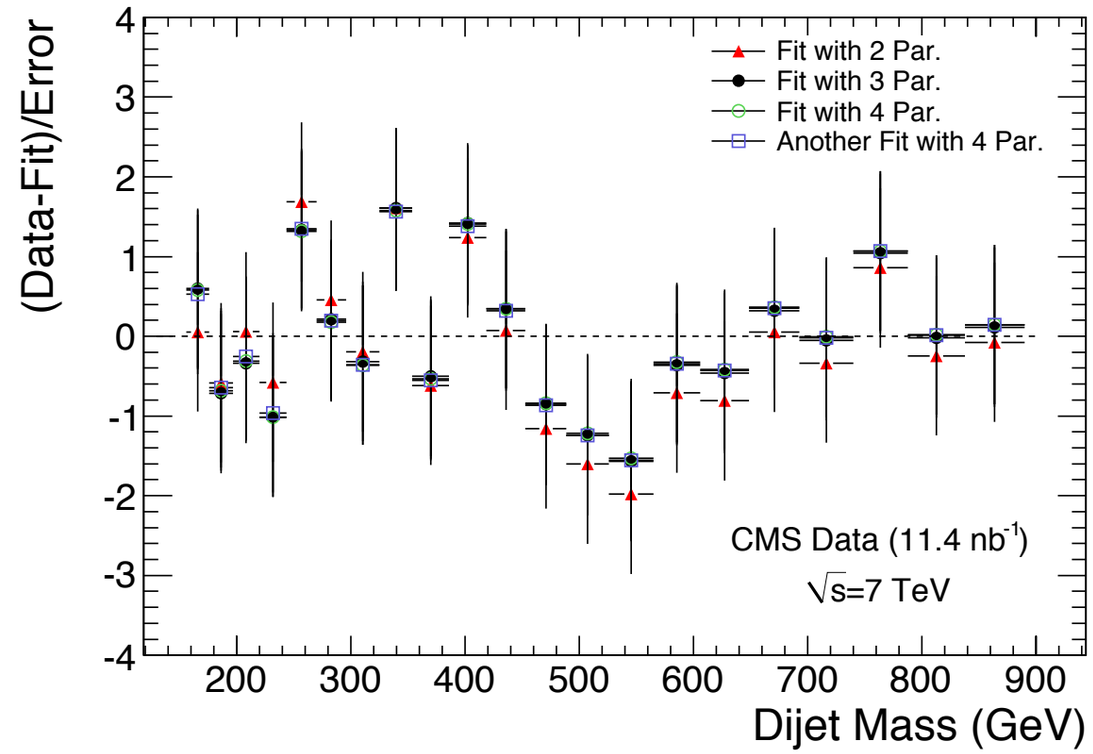


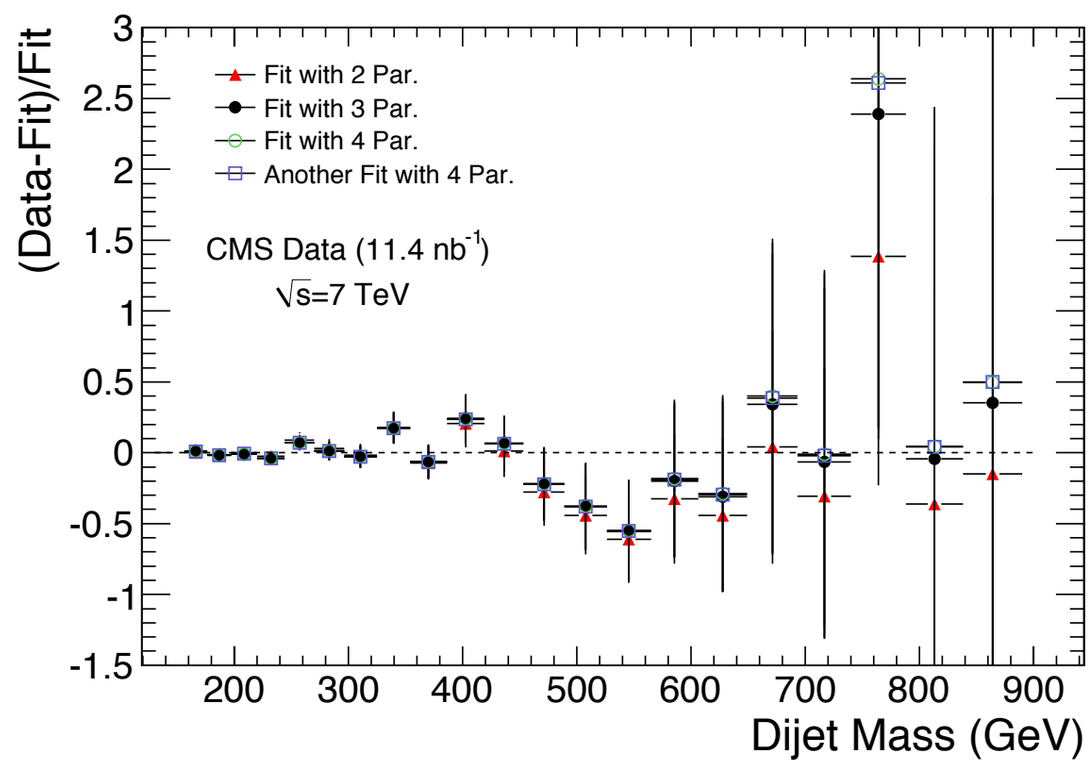


Another Fit Parametrization

- We have varied the choice of background parametrization
- We use the fit functions with 2 par., 3 Par. and 4 Par.
- 3 par. and 4 par. fits give almost the same result.

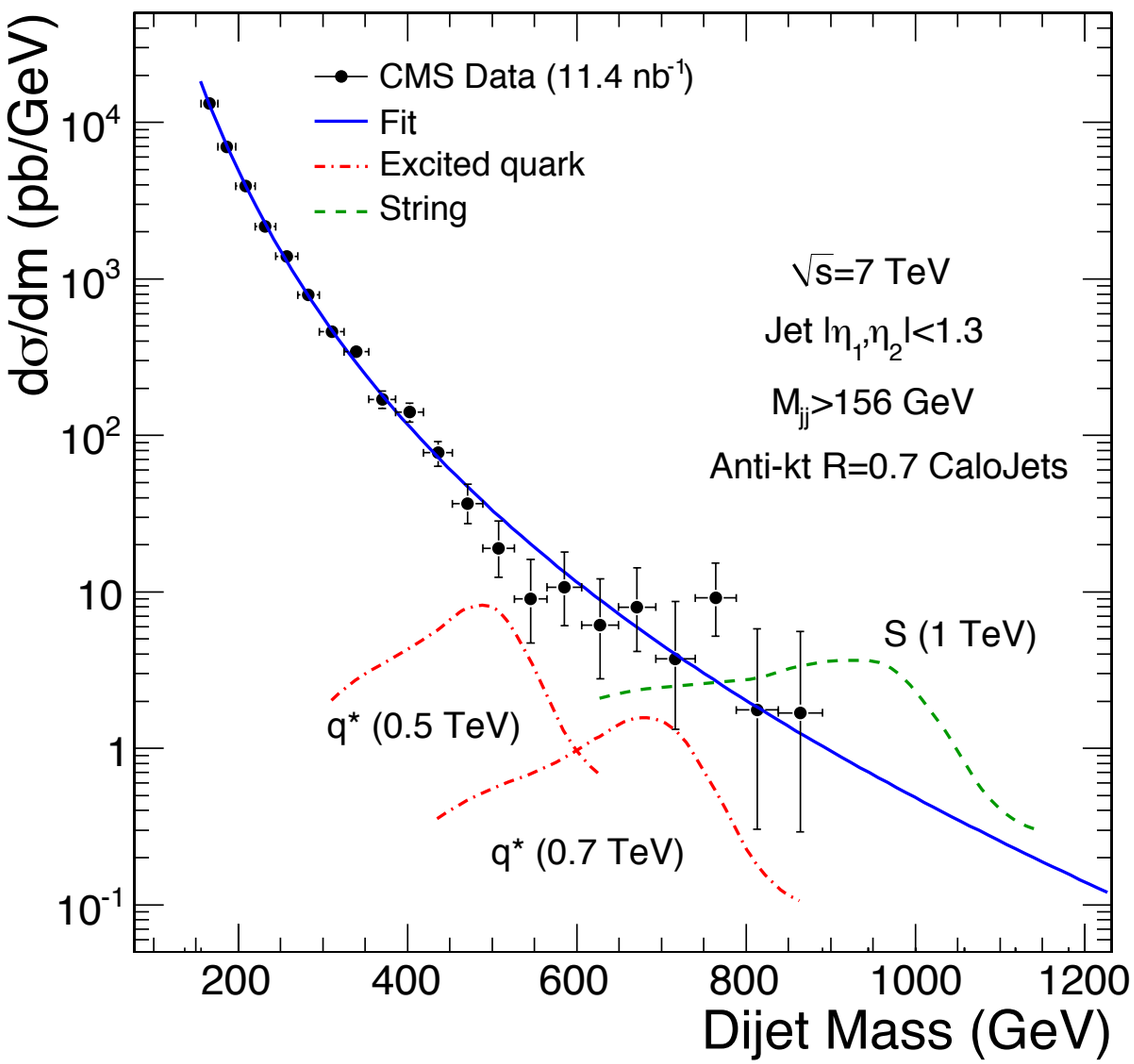
```
Chisquare/ndf for 2 par. Fit:
19.2775/19 : 1.0146
Chisquare/ndf for 3 par. Fit:
17.088/18 : 0.949333
Chisquare/ndf for 4 par. Fit:
16.8311/17 : 0.990066
Chisquare/ndf for Another 4 par. Fit
(used by CDF): 16.7794/17 : 0.987021
```

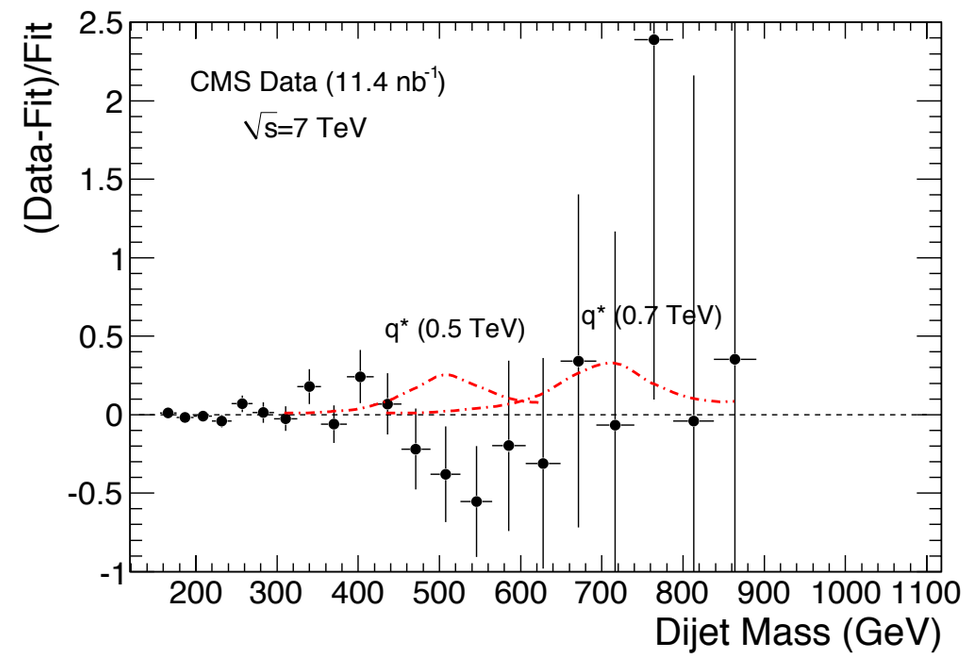


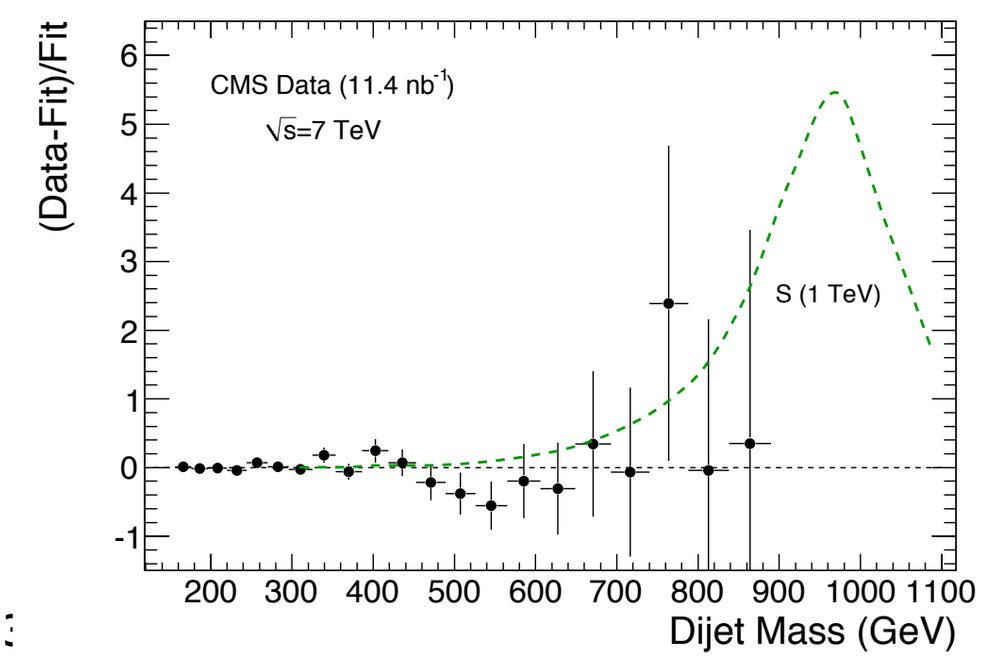


Fit and Signal

- We search for dijet resonance signal in our data.
- Excited quark signals are shown at 0.5 TeV and 0.7 TeV.
- String resonance signal is shown at 1 TeV.

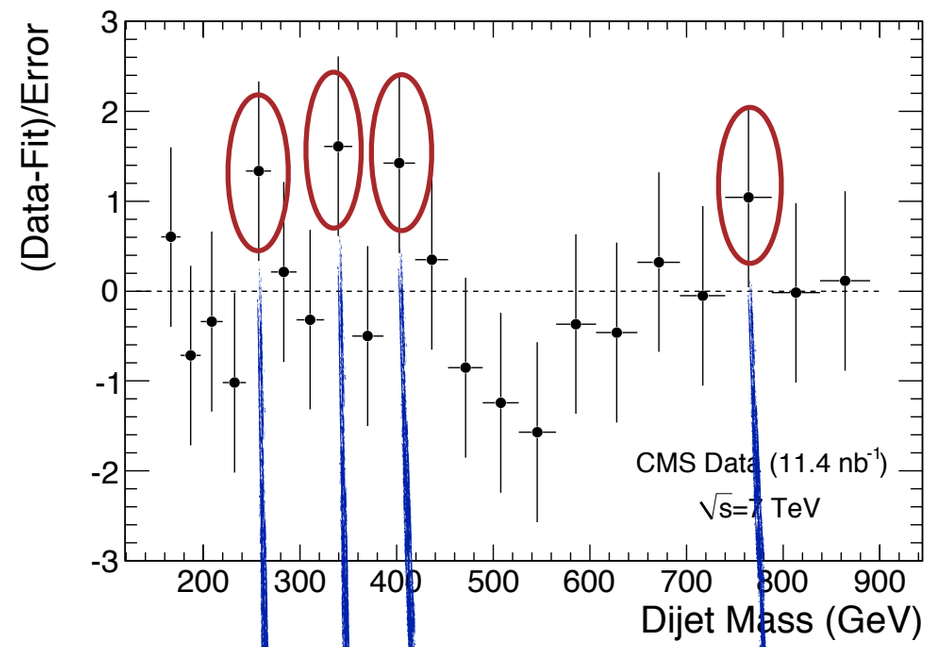


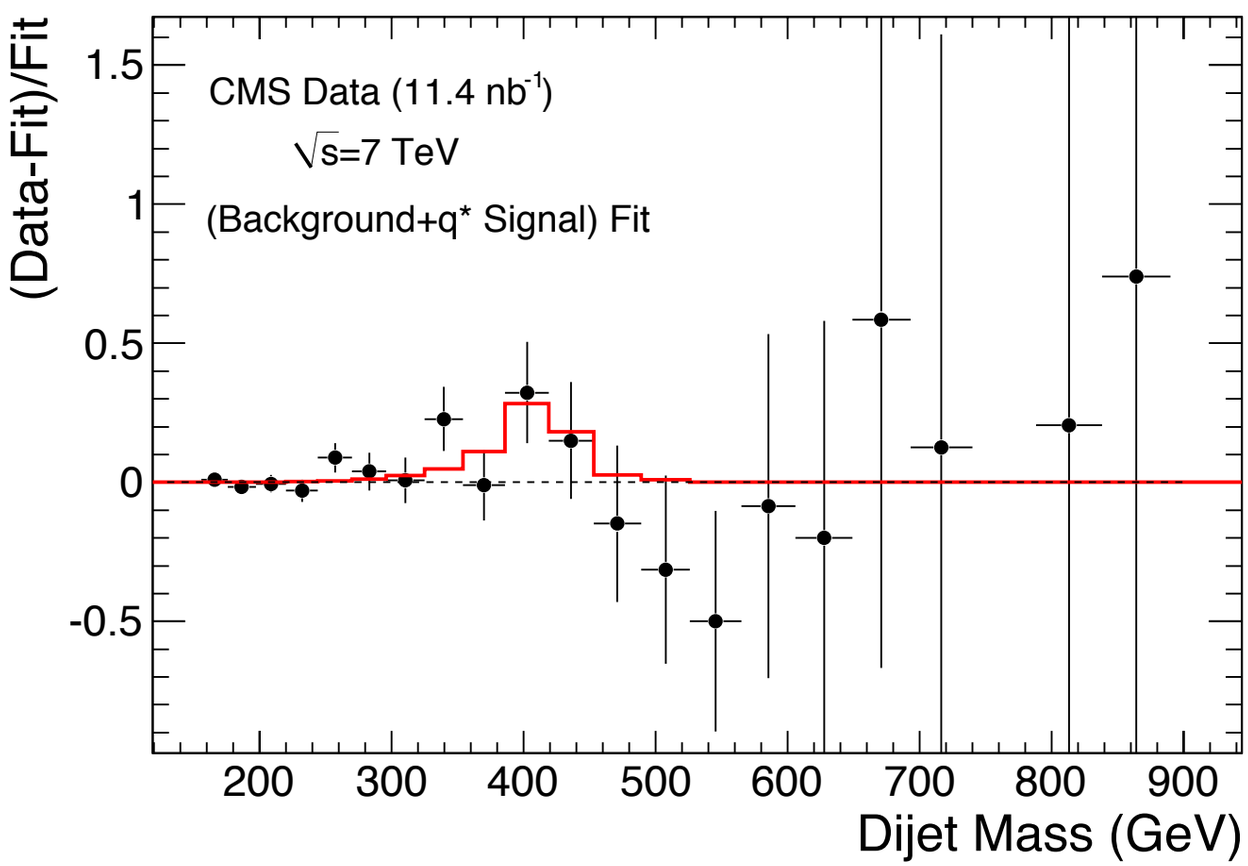


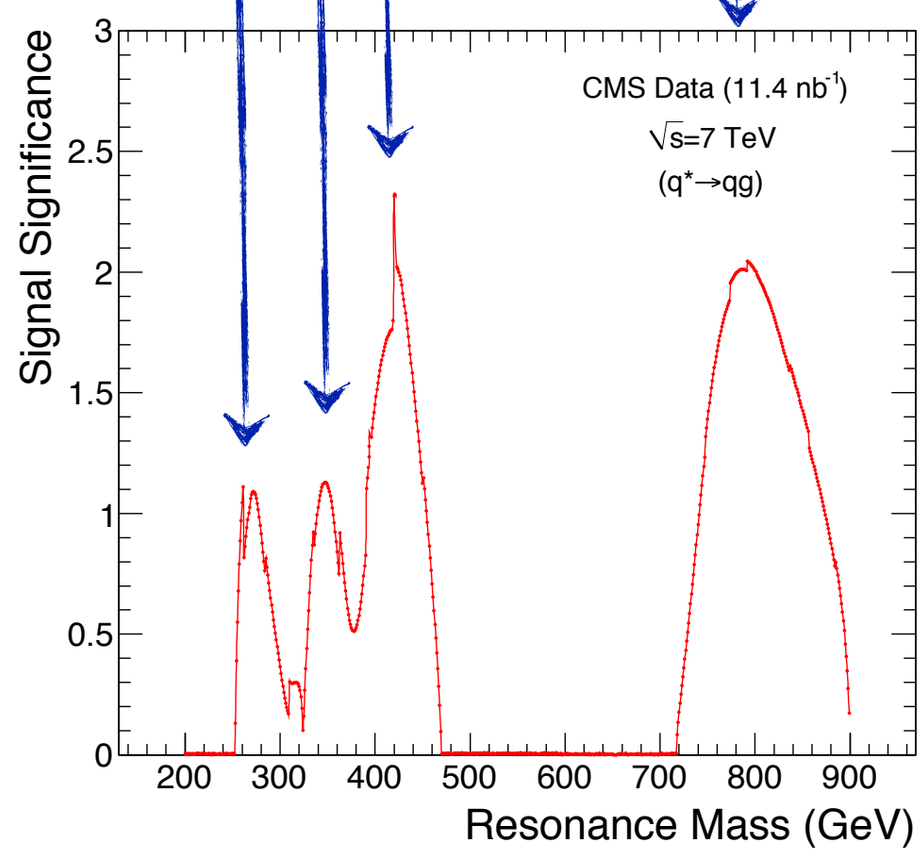


The Largest Fluctuation in Data

- Small fluctuation with shape of a resonance near 300 GeV, 350 GeV, 450 GeV and 800 GeV
- Best fit resonance (M_{jj}=421 GeV) has significance only 2.32 sigma from likelihood ratio.







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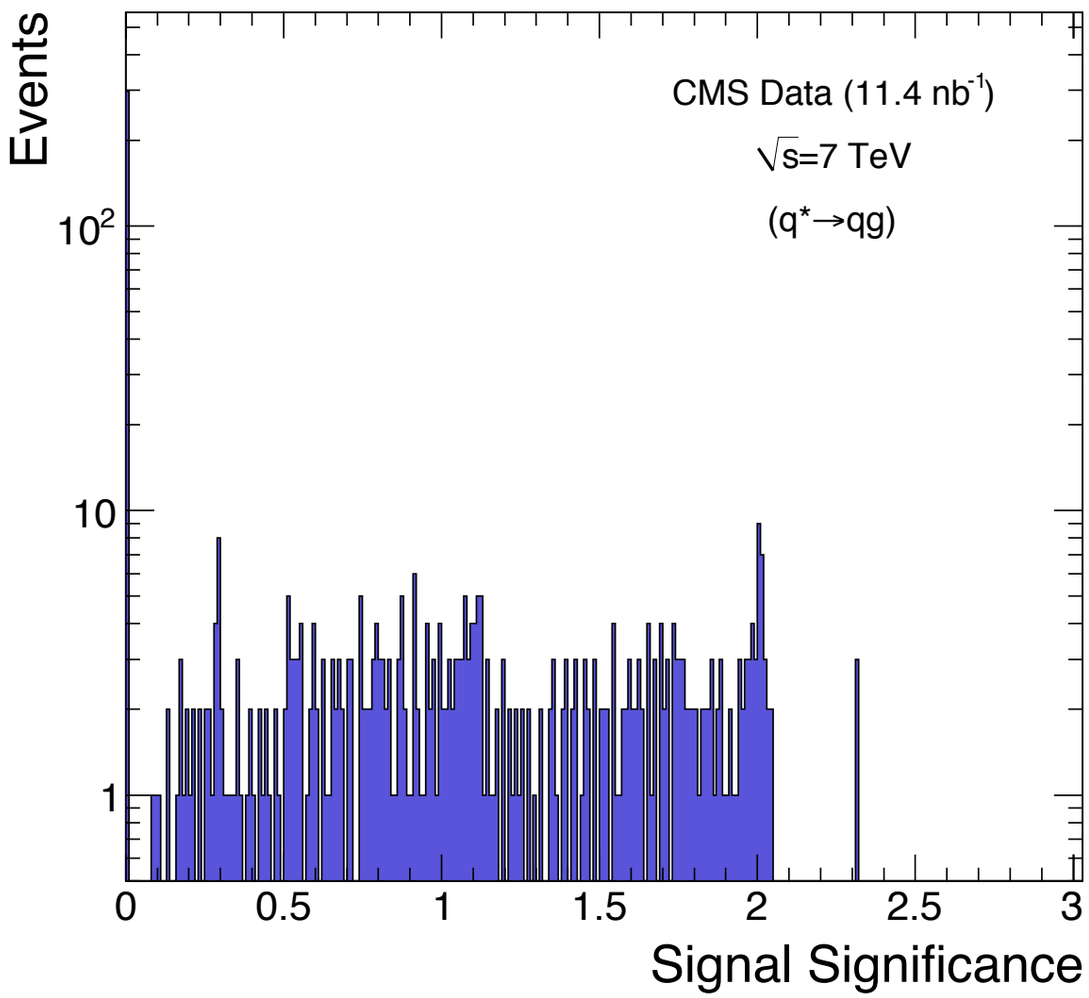
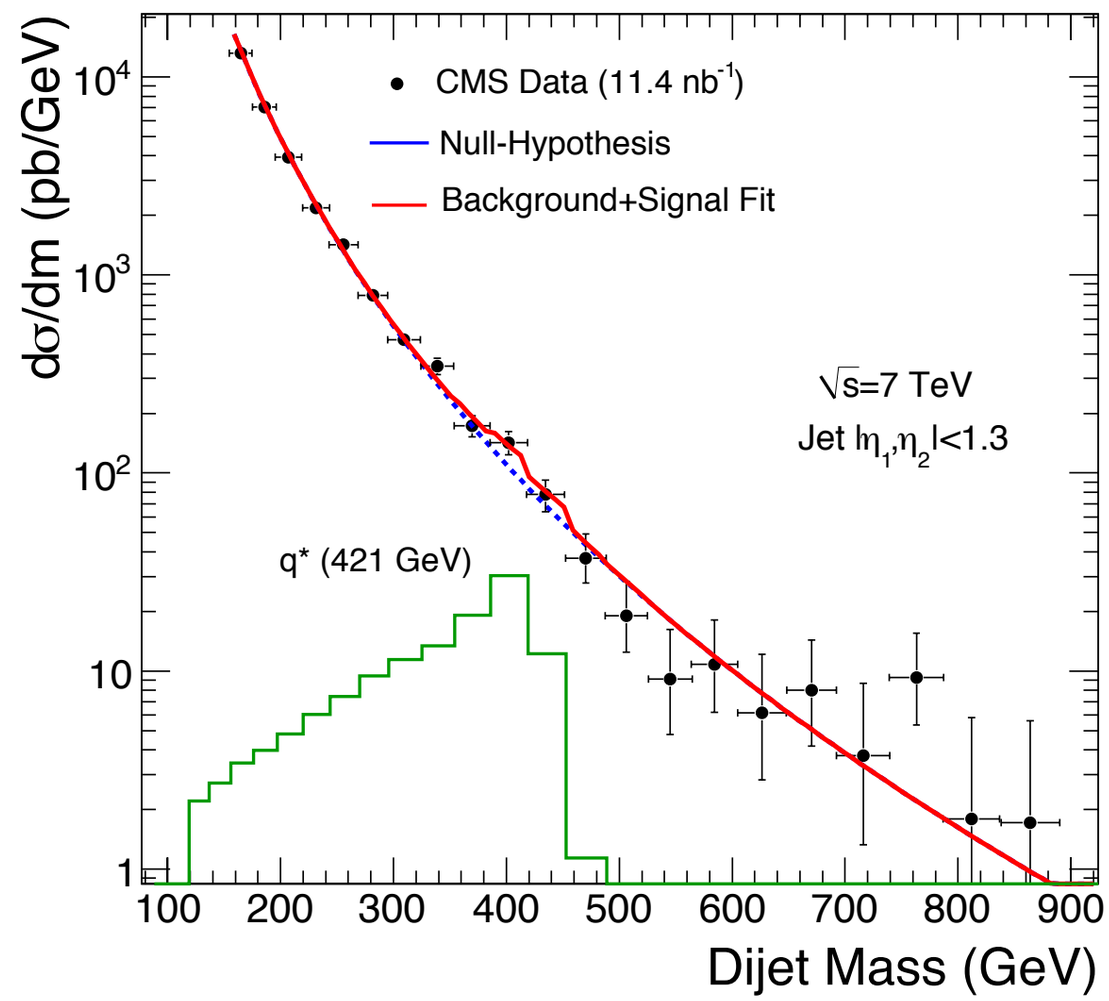
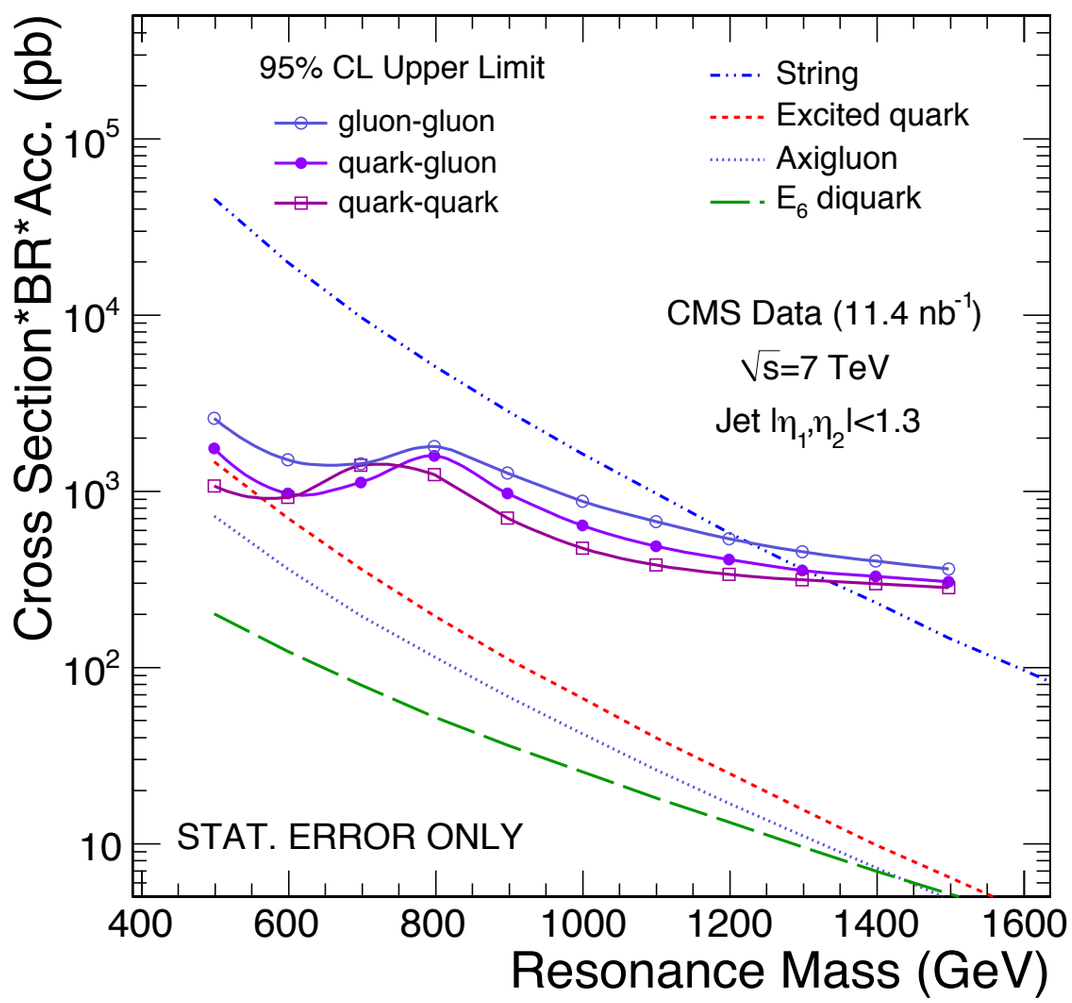
The Largest Fluctuation in Data - II





Limits with Stat. Error Only

- We use a flat prior to get the posterior probability density and find limit.
- To calculate limit on new particle cross section we use a binned likelihood by the Bayesian approach.
- 95% CL Upper limit with Stat. Error. Only compared to cross section for various model.
  - ✓ Show quark-quark and quark-gluon and gluon-gluon resonances separately.
  - ✓ gluon-gluon resonance is the widest and gives worst limit.



	95% CL Upper Limit (pb)		
Mass (TeV)	quark-quark	quark-gluon	gluon-gluon
0.5	1061	1736	2577
0.6	908	964	1478
0.7	1372	1123	1422
0.8	1235	1568	1752
0.9	690	962	1253
1.0	470	638	869
1.1	382	487	656
1.2	337	401	527
1.3	309	352	445
1.4	292	323	393
1.5	284	304	360