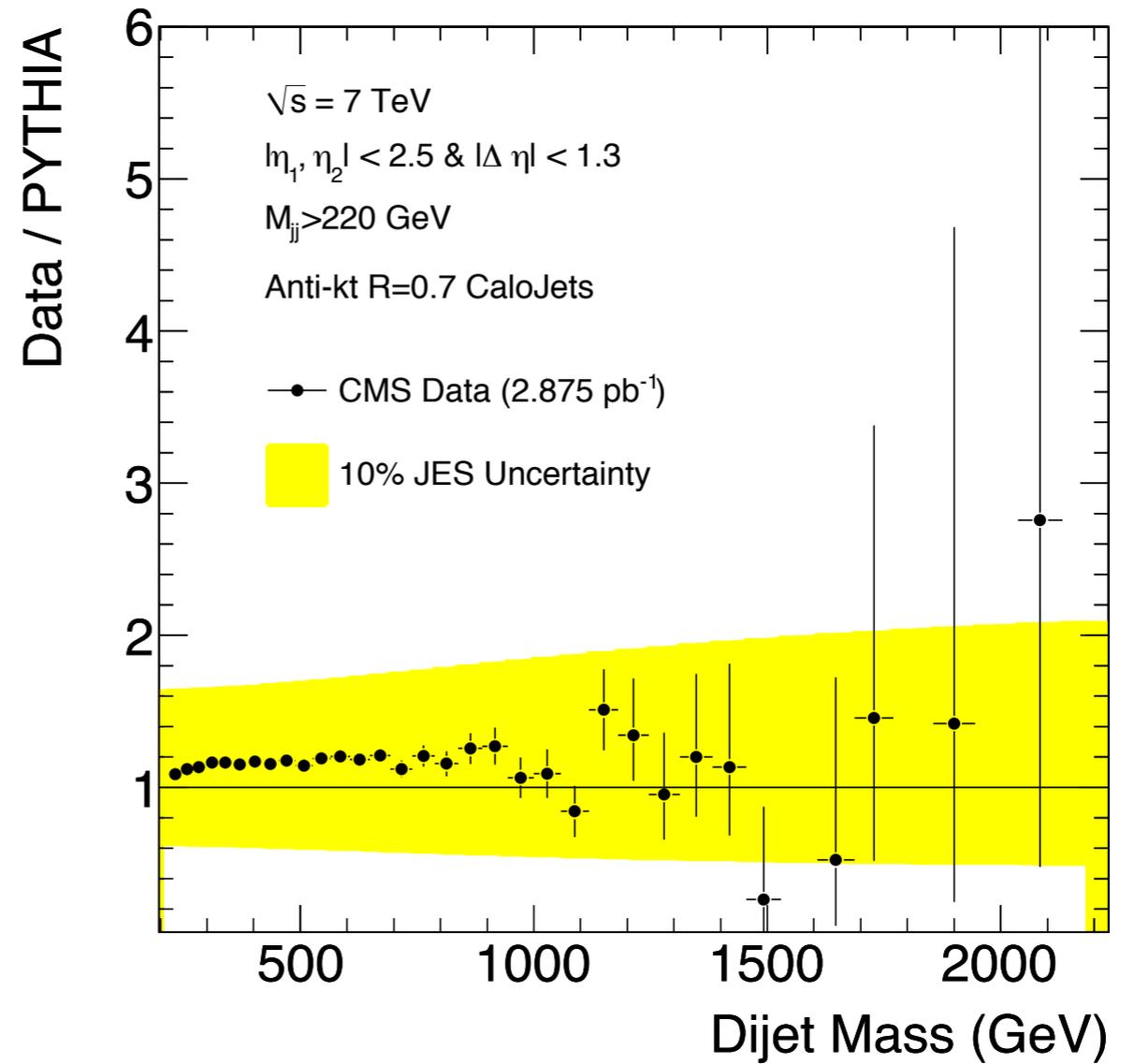
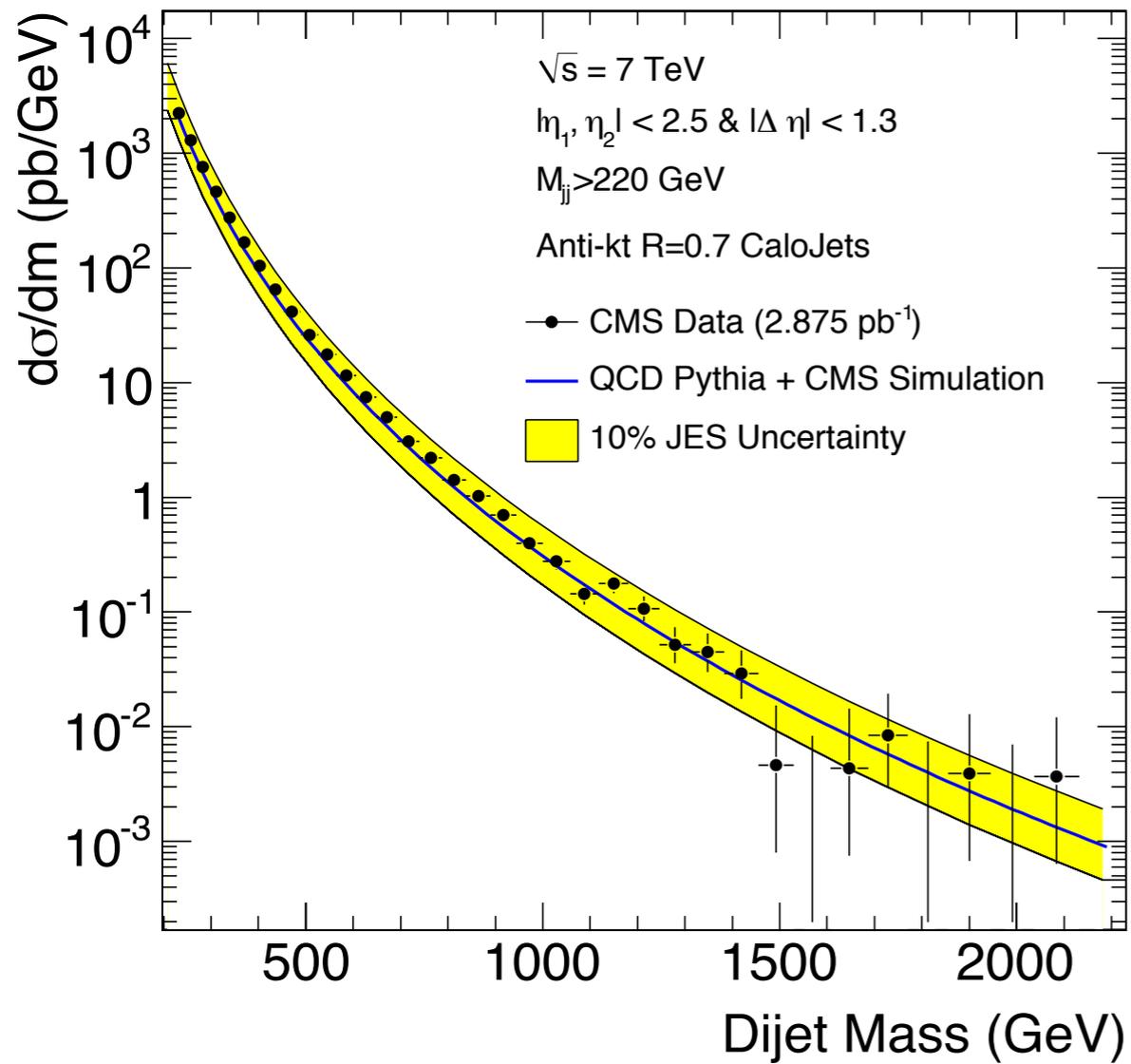




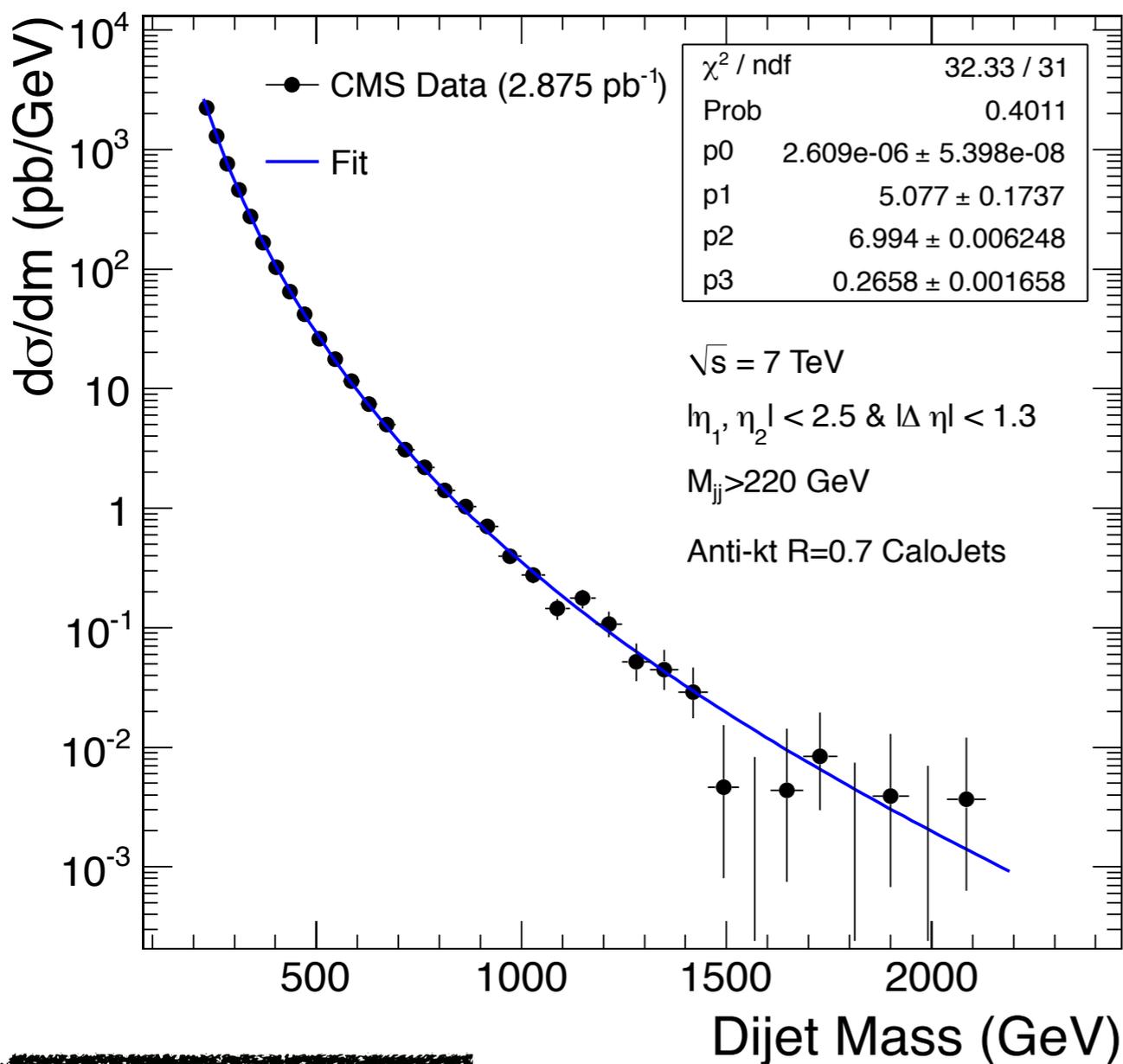
QCD and Data



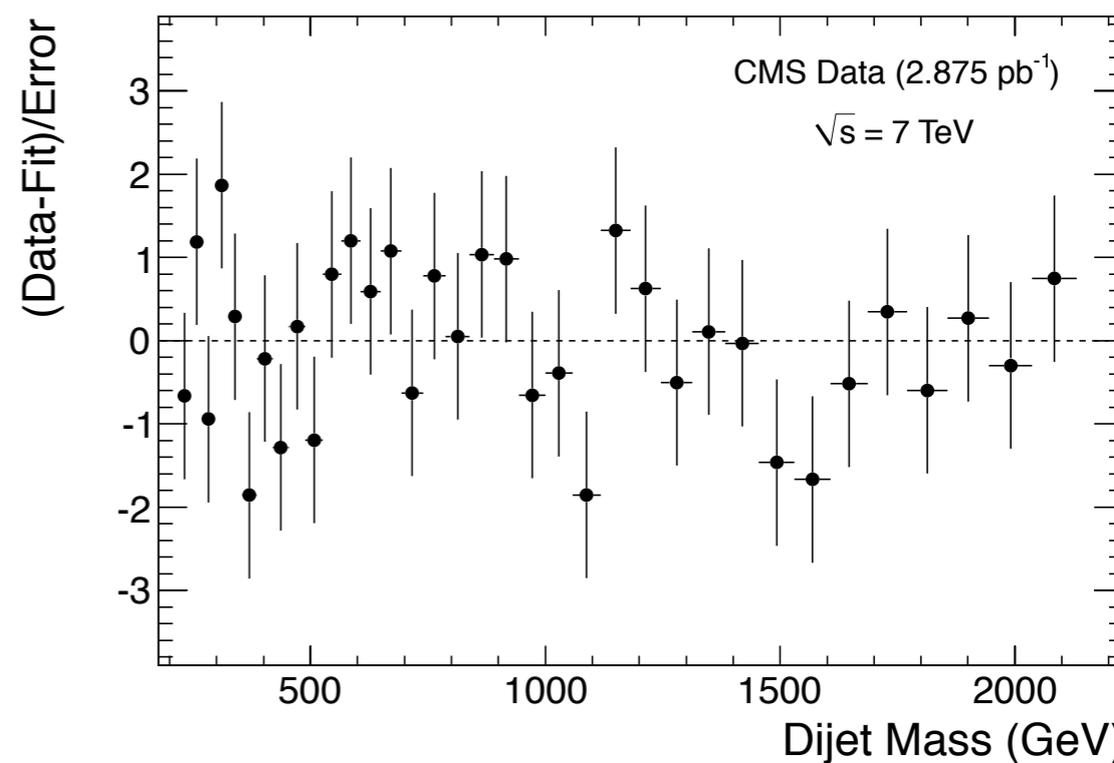
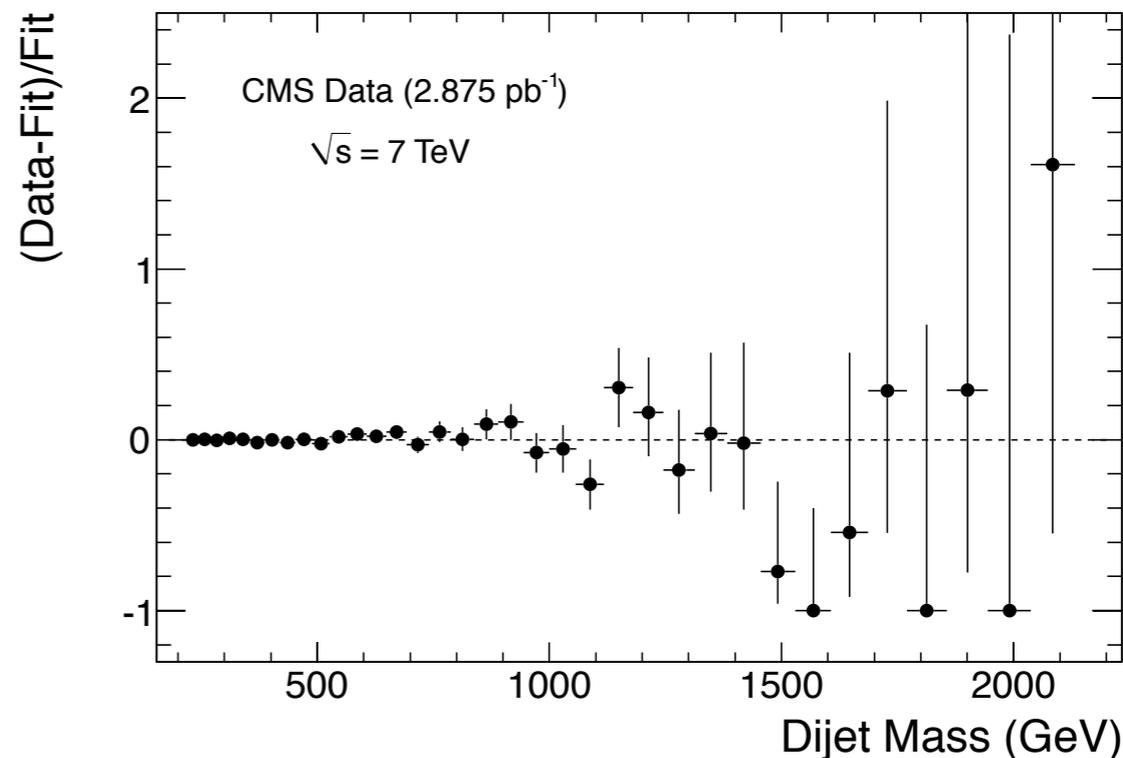


Dijet Mass and Fit

- We fit the data with the function with 4 parameters. (ATLAS and CDF II parametrization)
- We get a good fit.

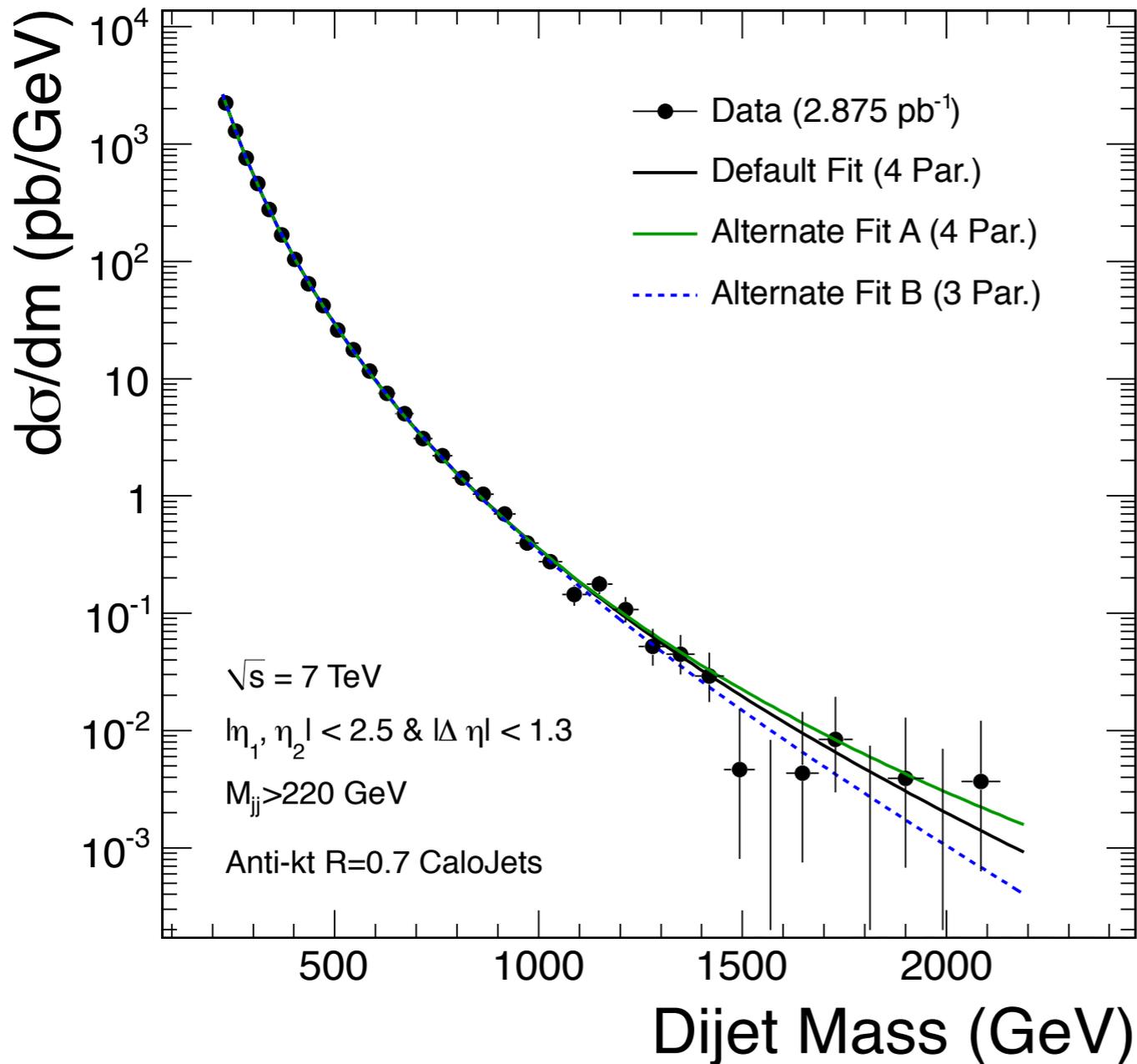


$$\frac{P_0 \cdot (1 - m\sqrt{s})^{p_1}}{(m / \sqrt{s})^{p_2 + p_3 \ln(m\sqrt{s})}}$$





Another Fit Parametrization



Default

$$\frac{P_0 \cdot (1 - m\sqrt{s})^{p_1}}{(m/\sqrt{s})^{p_2} + p_3 \ln(m\sqrt{s})}$$

$$\frac{P_0 \cdot \left(1 - m/\sqrt{s} + P_3 \cdot (m/\sqrt{s})^2\right)^{P_1}}{m^{P_2}}$$

A

$$\frac{P_0 \cdot (1 - m/\sqrt{s})^{P_1}}{m^{P_2}}$$

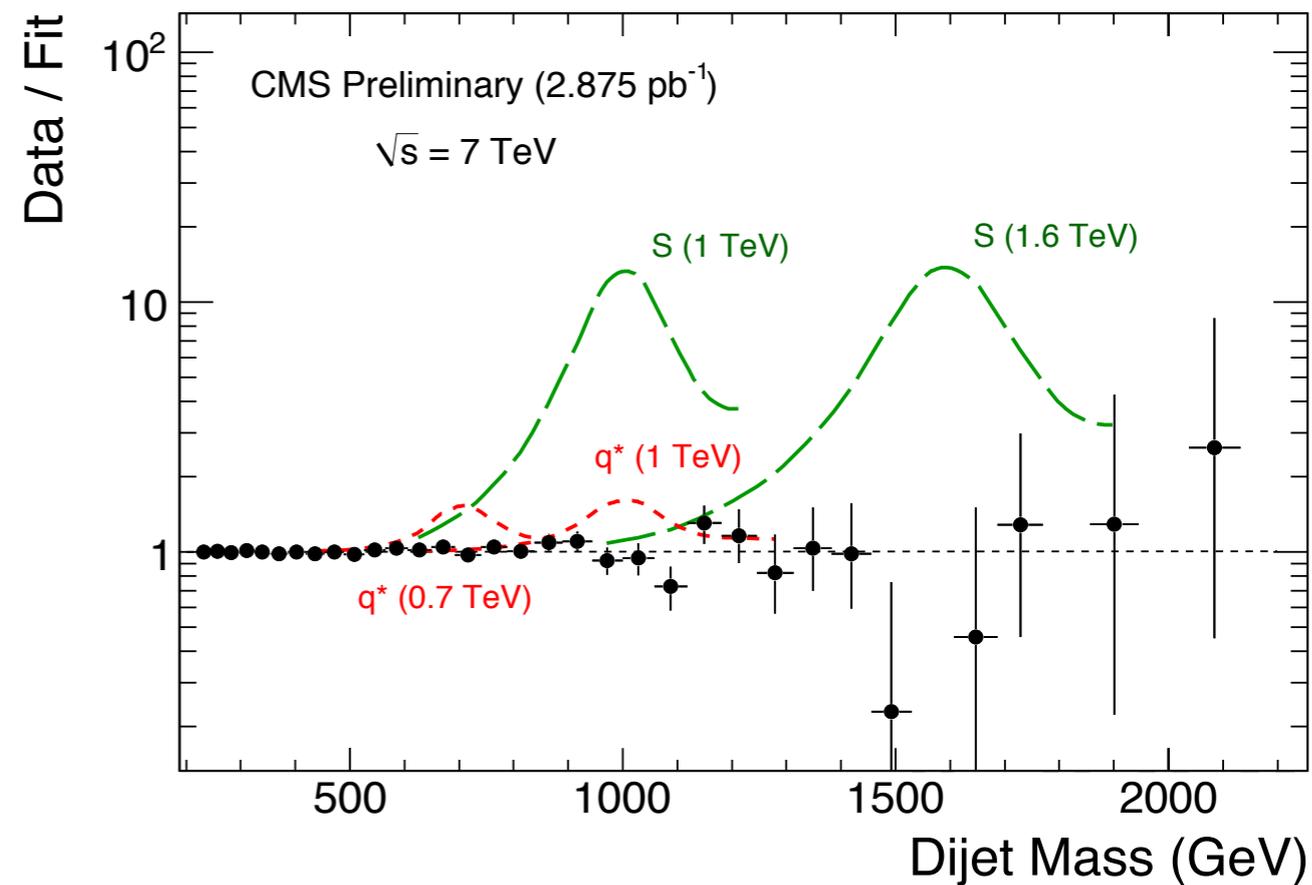
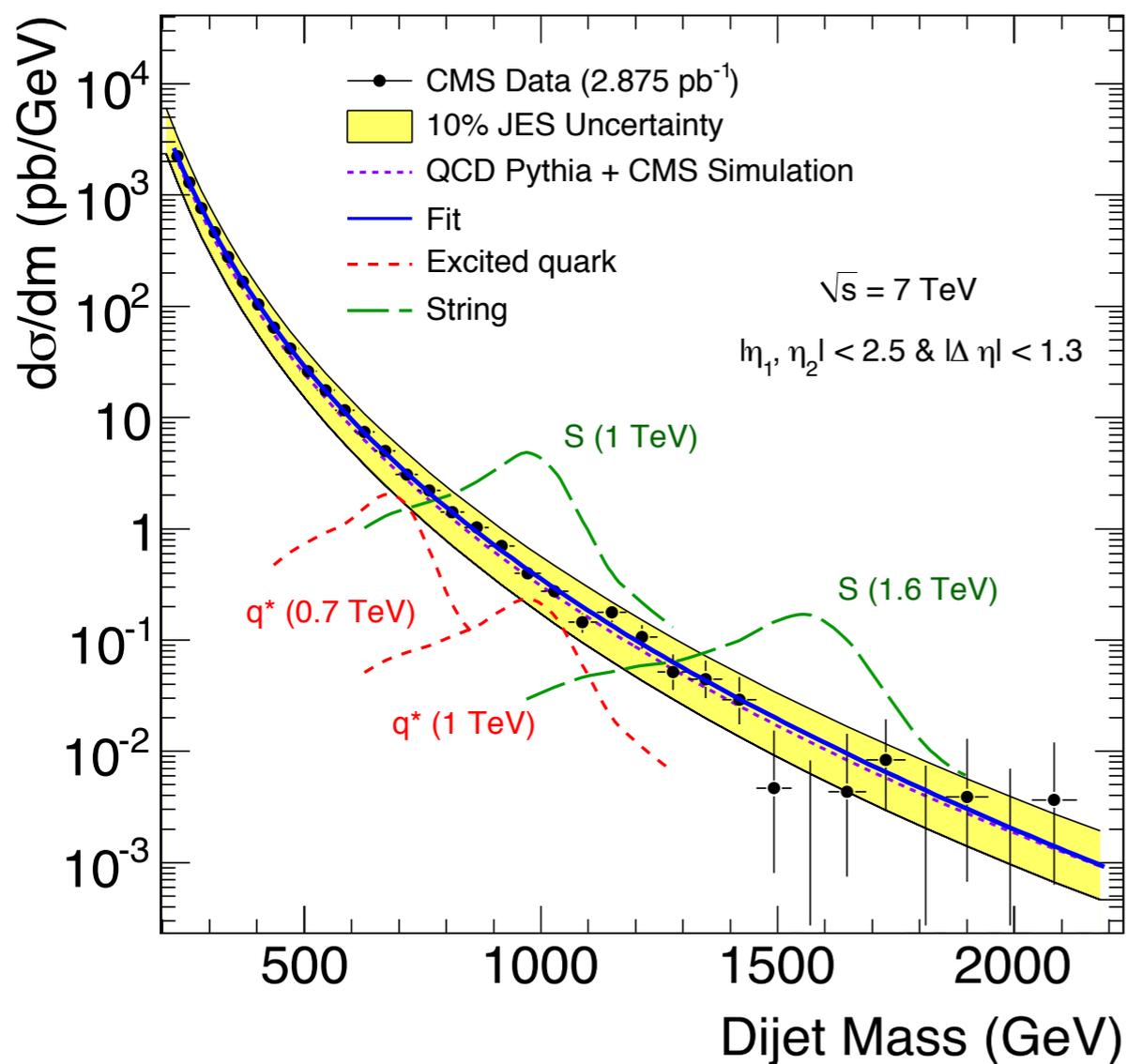
B

Chisquare/ndf for Default Fit: 32.32/31 : 1.042
 Chisquare/ndf for Fit A: 38.62/31 : 1.246
 Chisquare/ndf for Fit B: 39.28/32 : 1.223



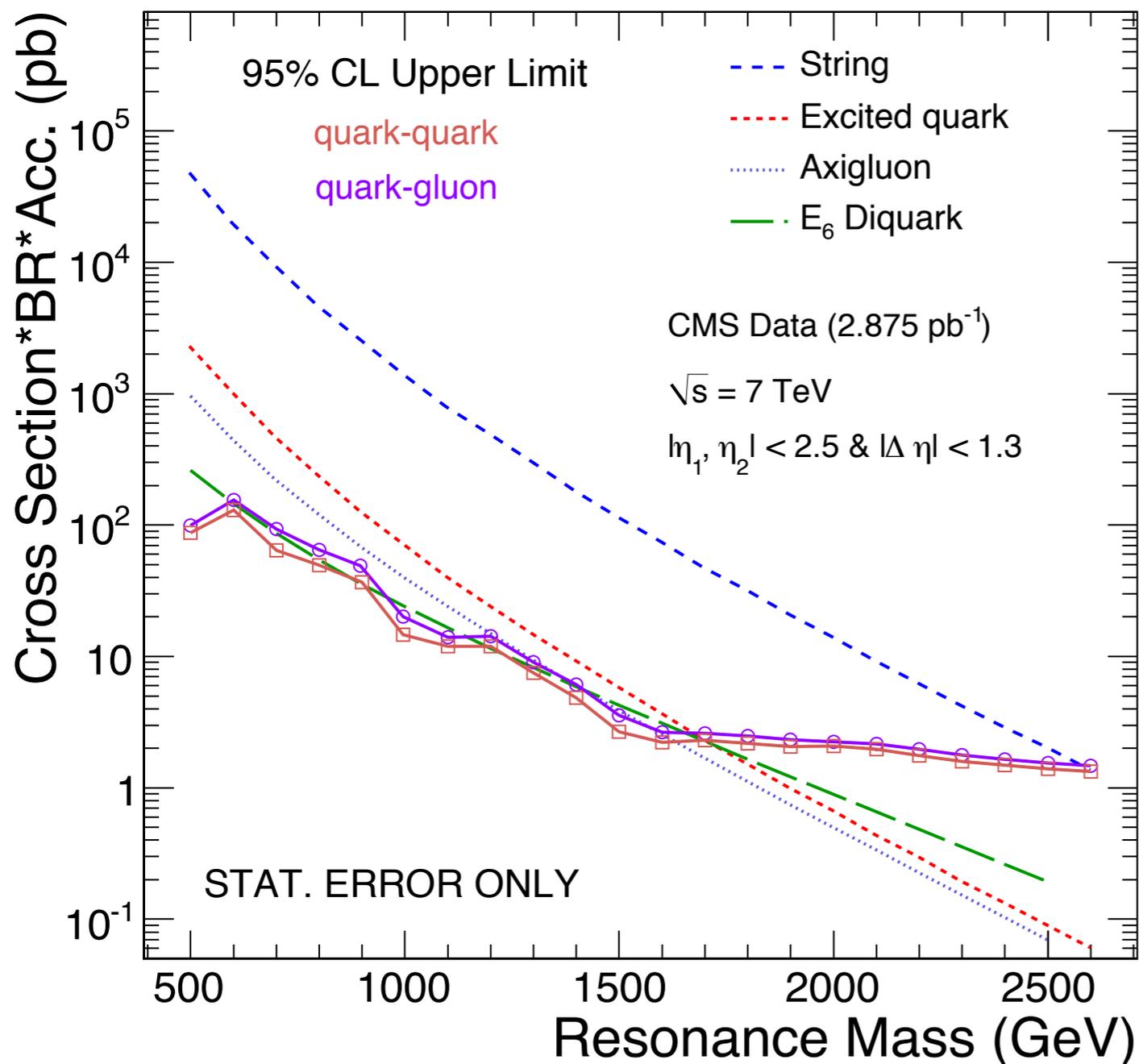
Fit and Signal

- We search for dijet resonance signal in our data.
- Excited quark signals are shown at 0.7 TeV and 1 TeV.
- String resonance signal is shown at 1 TeV and 1.6 TeV.





Limits with Statistical Uncertainties Only

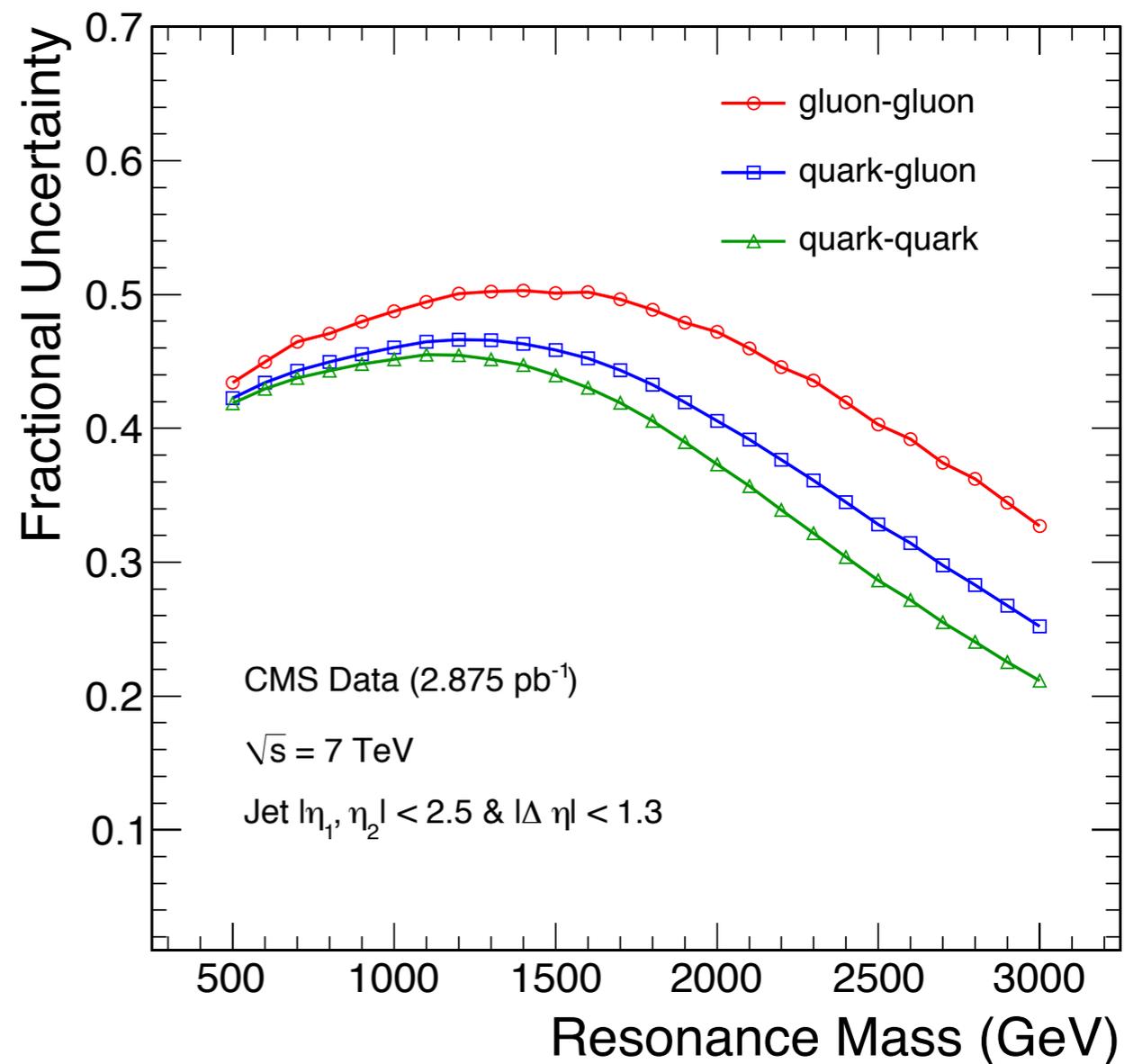
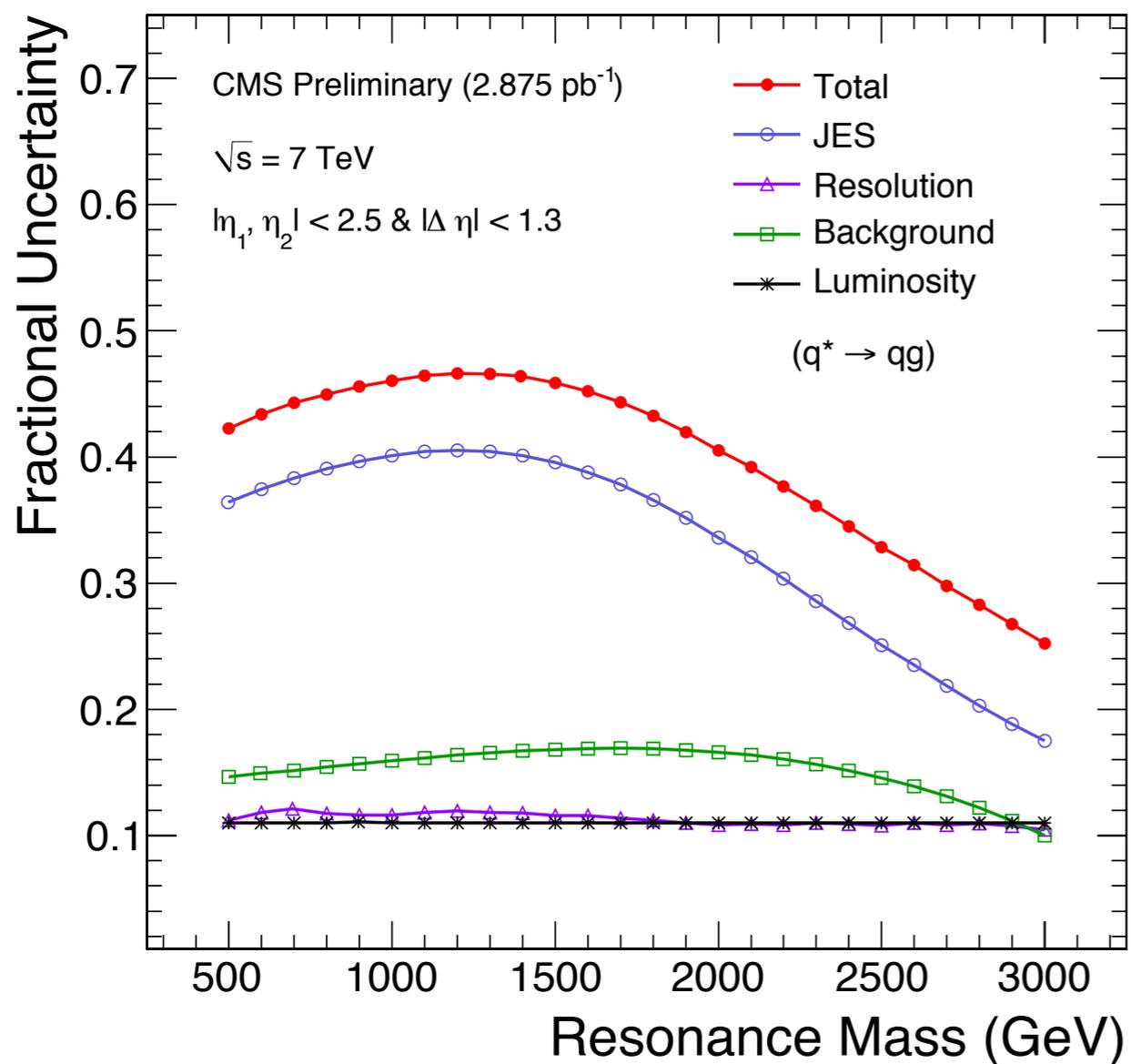


95% CL Excluded Mass Limit (Stat. Error Only)

- ✓ Excited quark
➔ $0.5 < q^* < 1.67$ TeV
- ✓ String Resonance
➔ $0.5 < S < 2.58$ TeV
- ✓ Axigluon/Coloron
➔ $0.5 < A/C < 1.63$ TeV
- ✓ E6 Diquark
➔ $0.5 < D < 0.87$ TeV
➔ $0.91 < D < 1.19$ TeV
➔ $1.23 < D < 1.70$ TeV

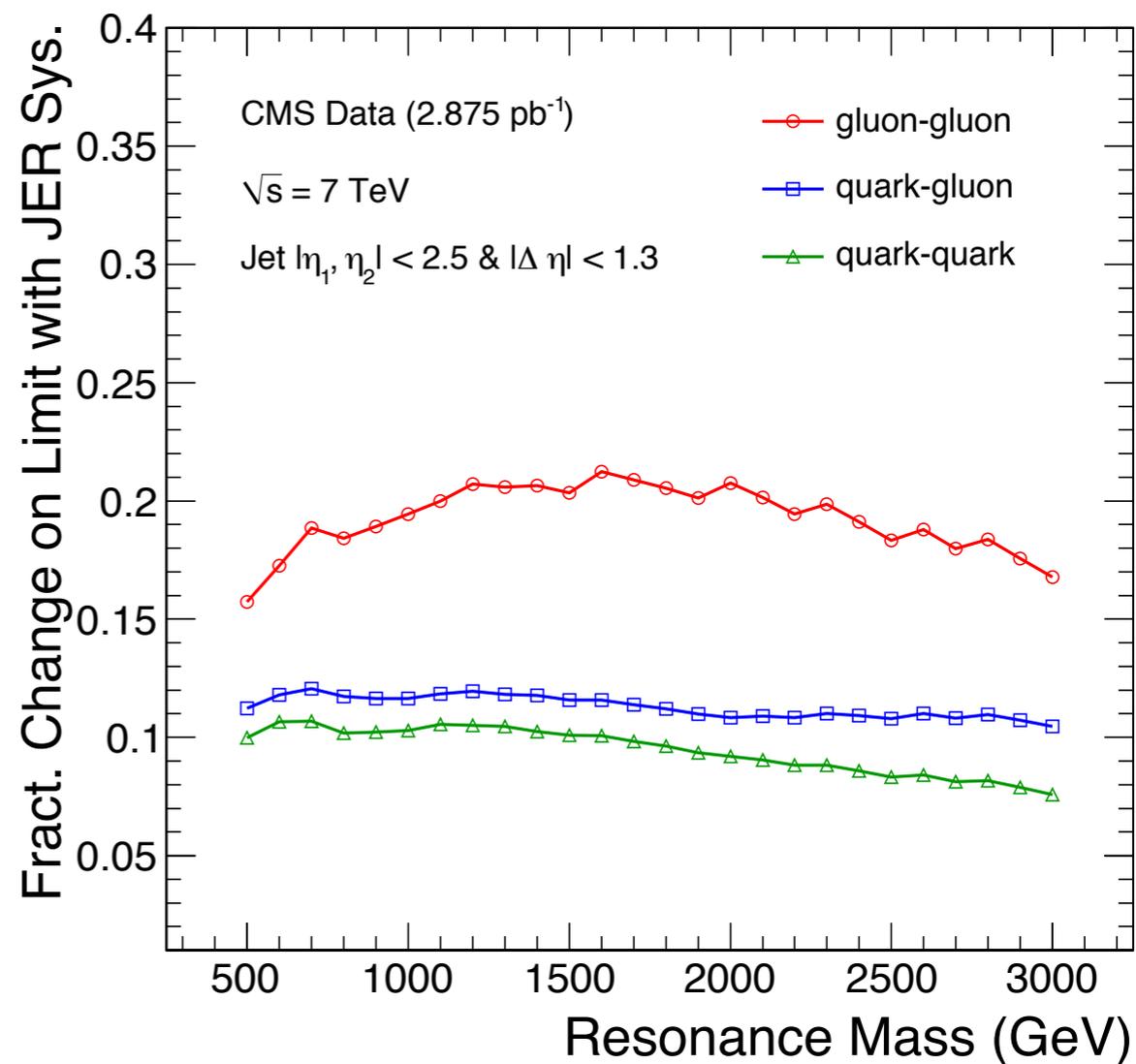
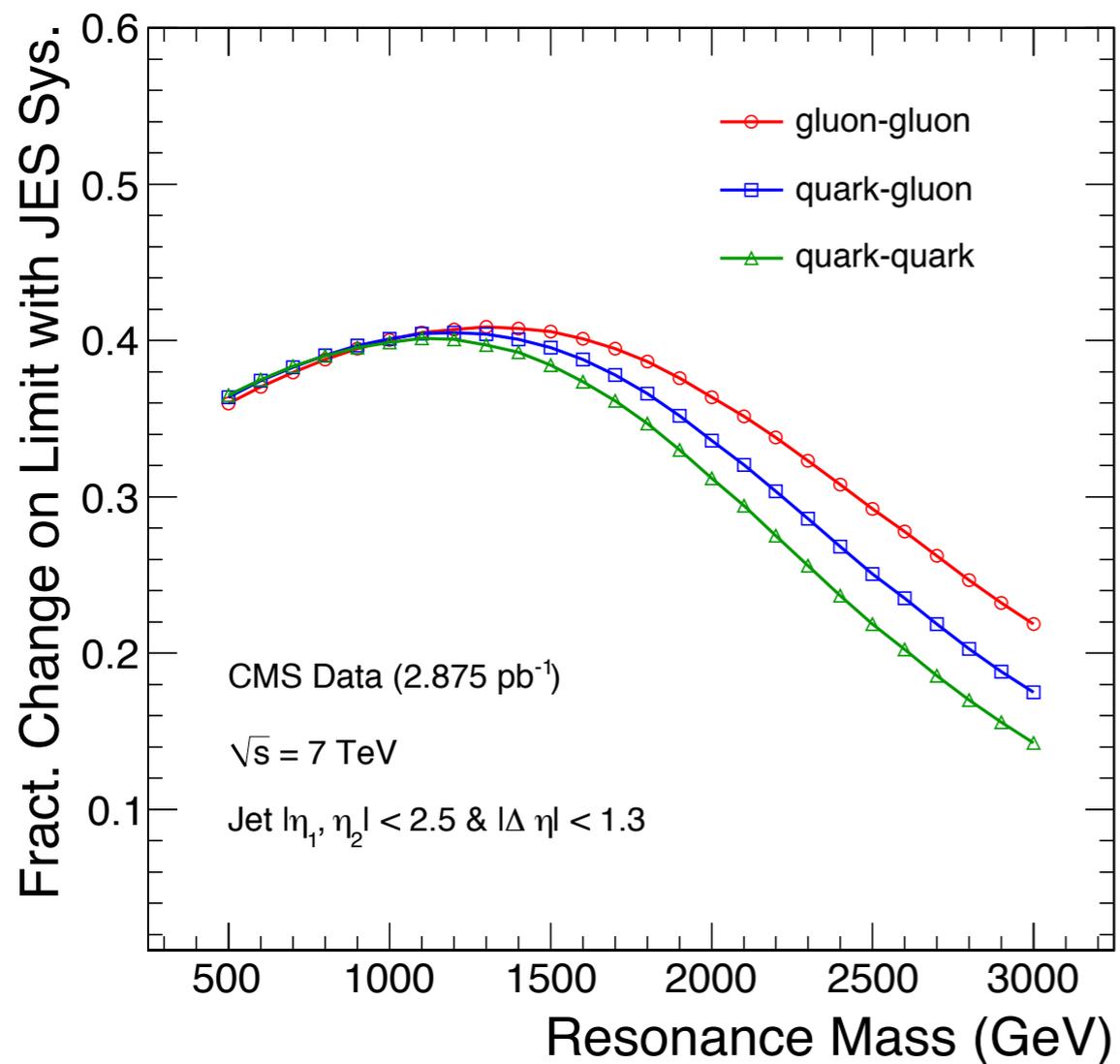


Systematics



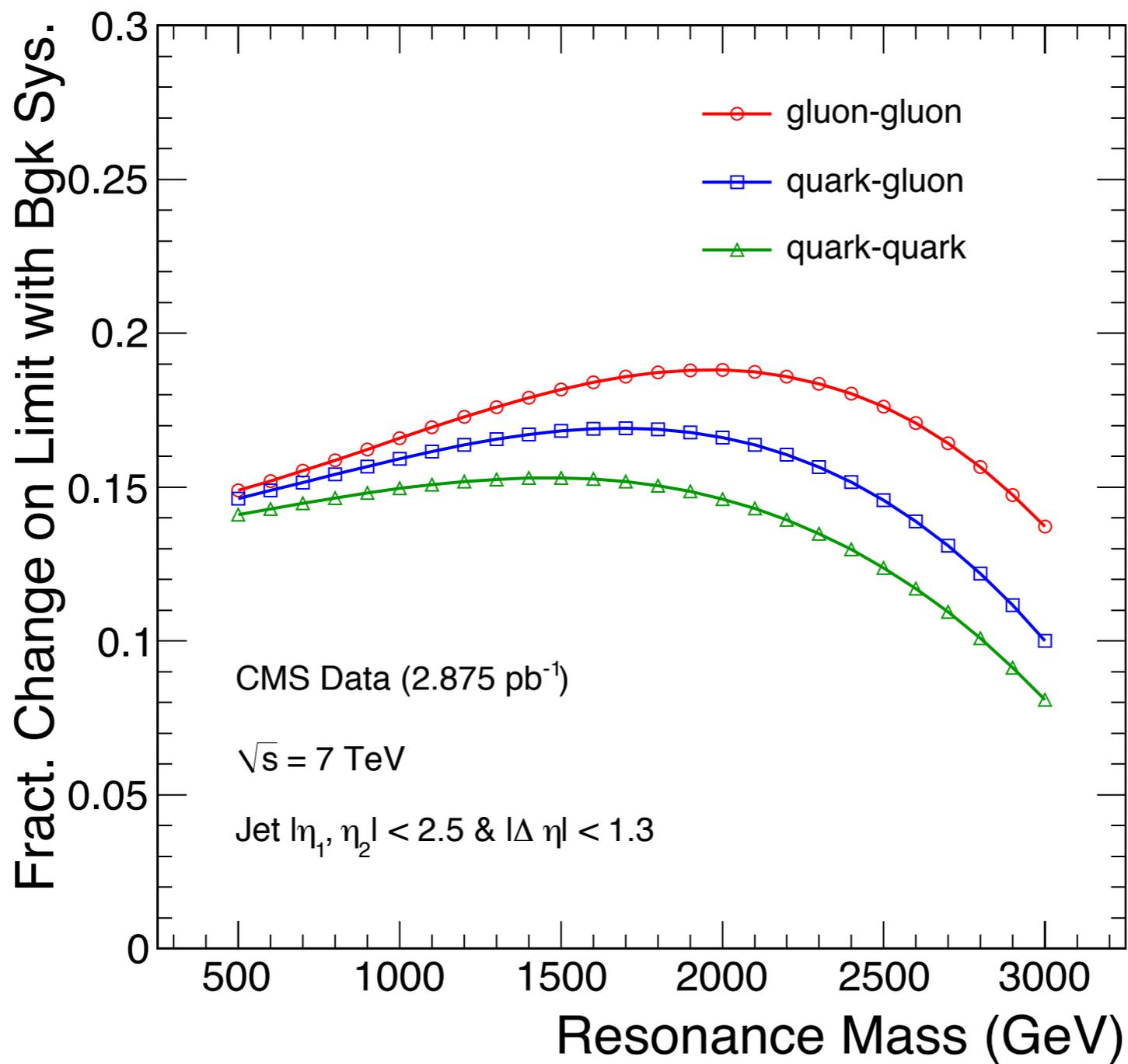


JES and JER



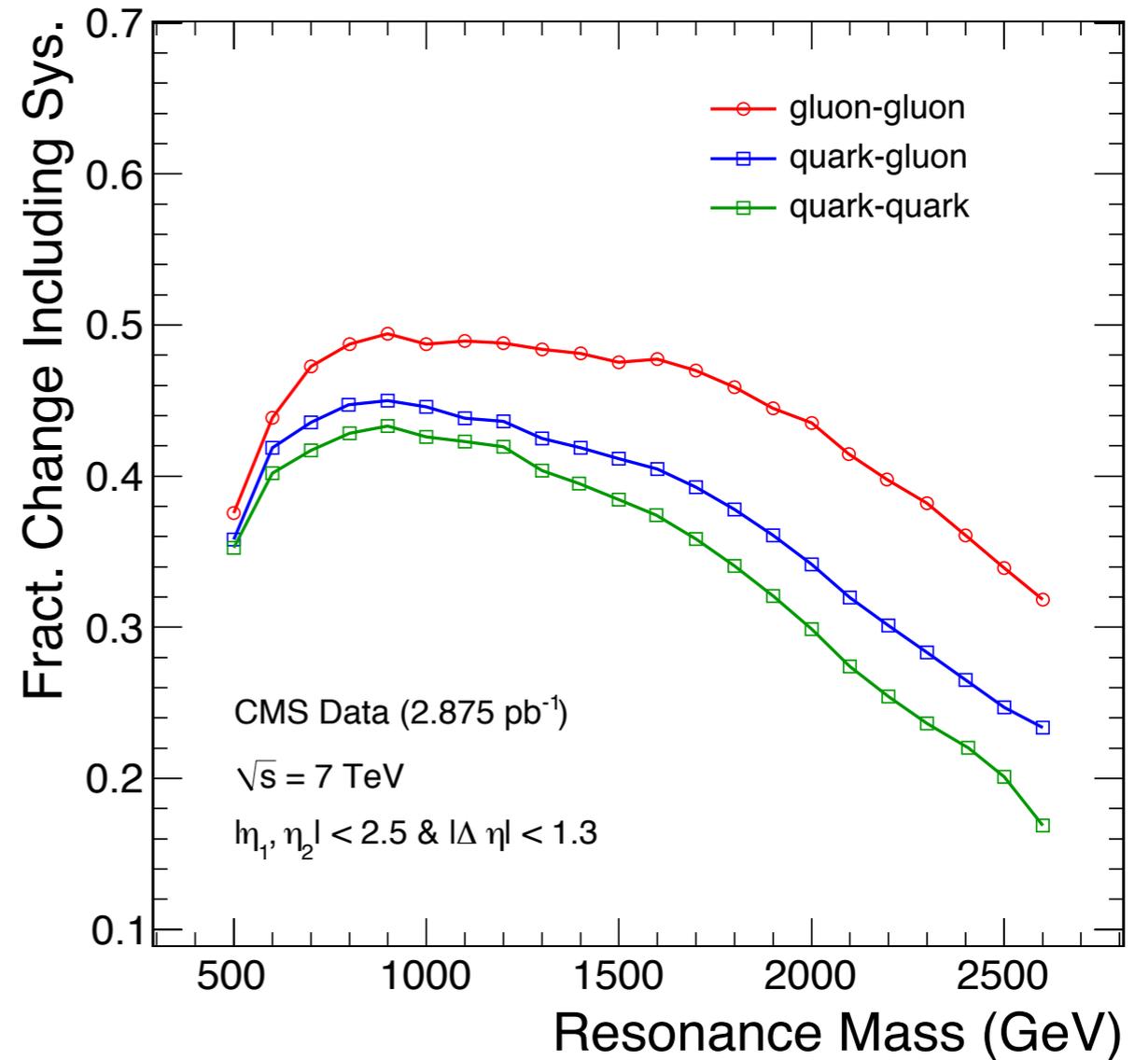
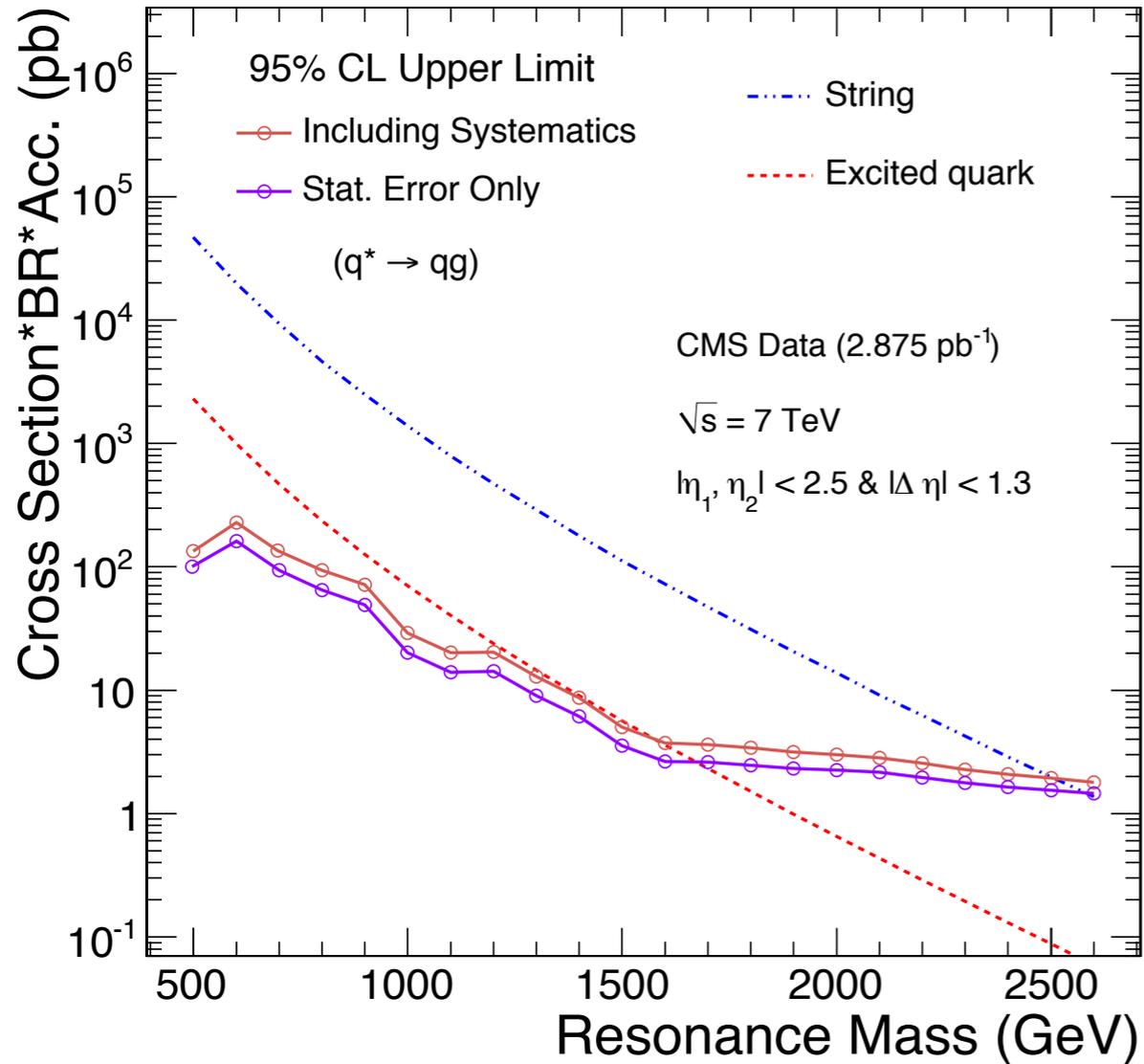


Background



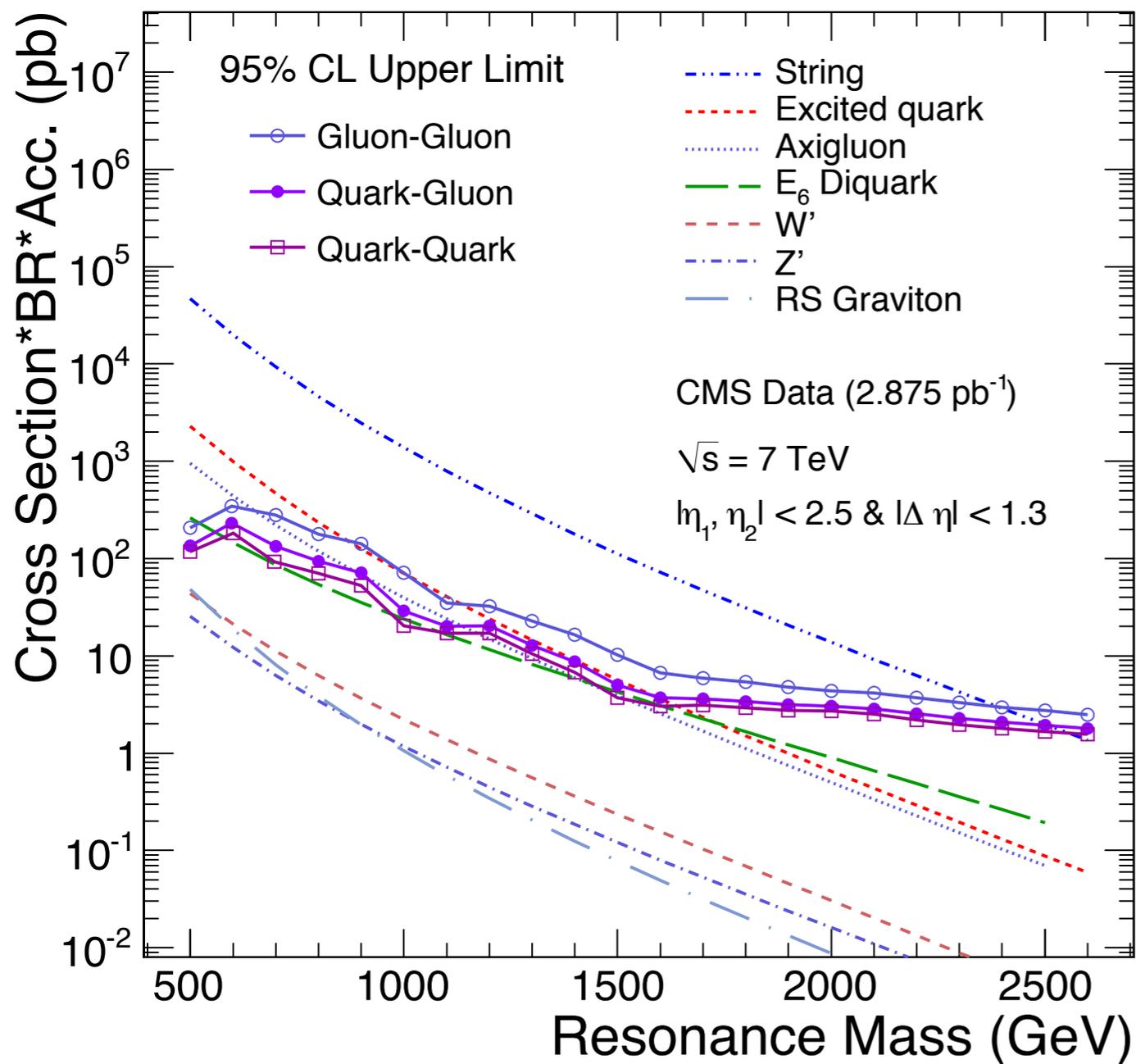


Incorporating Systematics

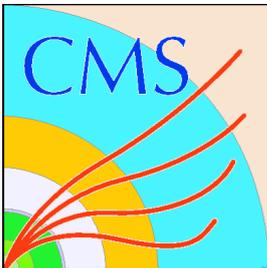




Results



- 95% CL Excluded Mass Limit
- ✓ Excited quark
 ➔ $0.5 < q^* < 1.58 \text{ TeV}$
- ✓ String Resonance
 ➔ $0.5 < S < 2.50 \text{ TeV}$
- ✓ Axigluon/Coloron
 ➔ $0.5 < A/C < 1.17 \text{ TeV}$
 ➔ $1.47 < S < 1.52 \text{ TeV}$
- ✓ E_6 Diquark
 ➔ $0.5 < D < 0.58 \text{ TeV}$
 ➔ $0.97 < D < 1.08 \text{ TeV}$
 ➔ $1.45 < D < 1.60 \text{ TeV}$



Axigluon/Coloron & E6 Diquark

