

Dear Authors

Congratulations for the nice work and draft. Here are my "late" comments for version 0.1.

I know that 0.2 is appeared but I had 0.1 on the plane with me. I apologize that I gave the paper a very quick read...

=> Not a problem. We'll make sure we get it all sorted out. Thanks for getting us what you did.

As a general comment I find the paper short but difficult to read especially for somebody not familiar with CDF and di-photon analysis at CDF. There are many references to previous papers/work without giving the reader any hints of why some things are important. I believe that a PRL should be readable by a wider audience than CDF and D0 and that is important that we try to convey the "logic" and the improvements implemented in the analysis. Examples of this issues are EMTiming and the Met Model to which you refer in page 1. I was wondering if you could convey at the beginning why these two elements are going to make this analysis better than what was done before. I also find the term EMTiming a bit strange. Is this term used in reference [12] ? I did not have time to look at the references.

=> We have significantly upgraded the paper since version 0.1. Our hope is you find it better.

Physics questions You are using a different data sample than PRD are we sure that the met model works well also on this larger sample ?

=> Yes, Figure 1 shows that our inclusive diphoton sample has the Met Resolution being well modeled. This is why we included it prominently in the PRL.

Here are smaller comments

Page 1

Title

Search for Gauge-Mediated Supersymmetry-Breaking Models

Are we really searching for models ????

=> The same comments as Sunil's. Fixed already in version 0.3

The motivation is a bit a weak ... "For theoretical reason..."
You might want to make this first paragraph stronger.

=> We re-used the same phrase as in 202/pb PRD (Ref. [7] in our PRL draft)

Complementary searches ... what do you mean ???? You have to optimize your searches differently ????

=> Also same comments as Sunil's. Fixed in version 0.3.

Page 2

one of four triggers. You could say that you are triggering on isolated di-photons events

=>Re-phrased whole paragraph according to Sunil's and Andrey's comments.

To minimize the number of SM events in the presample with large met due to calorimeter energy mismeasurement we remove events if the met vector points along the direction, within $\Delta\phi < 0.3$, of the second photon or a narrow jet, with $E_{jT} > 5$ GeV and $|\eta| < 2.5$, located close to the calorimeter cracks at $\eta=0$ and $|\eta| \approx 1.1$ where these objects can be partially lost . This sentence is too long and complex. Try to split it and simplify it.

=> We have simplified this sentence and moved the detail to a citation [13].

What do you mean by "second photon" (are the photons ranked in energy ? Do you say so somewhere ?)

=> Done.

What do you mean by "narrow jet" ?

=> "narrow" removed.

Does "these objects" refers to the jet and the second photon only?

=> Basically yes. There are several different main objects in our analysis. Others can exist but should be tiny.

For events with multiple reconstructed vertices we pick the vertex with the highest $P_{\text{tracks}} p_T$ [3], except when if assigning the photons to a different vertex lowers the met, we take that met and the photon ET's to be from that vertex for all calculations.

What do you mean ??? this sentence is not clear. Do you take only one photon to be from that vertex ???

=> We changed in the new draft 0.3. Perhaps it is better now, if not, let's discuss. It wasn't easy to say this in a few sentences considering PRL length. For multiple vertices we calculate photon ET and MET for every vertex and correct the MET for this difference. If it produces a smaller MET we take these new values of the photon ET and MET, and use then these values. Details are described in Section 2.2 in cdfnote 9575.

Where $\sigma_t = 1.66$ ns and is a measurement of consistency with being from the collision and $\sigma_{|t_1-t_2|} = 1.02$ ns.

->where $\sigma_t = 1.66$ ns measures time consistency with the collision and $\sigma|t_1 - t_2| = 1.02$ ns.
Also at the beginning of the sentences you have one photon, at the end you are discussing two....
Consider separating the two selections.

=> These are two different requirements. Details are described in Section 2.2 in cdfnote 9575. However, we simplified this sentence and removed the detail included in this sentence to make it more clear in the version of 0.3.

Page 3

Line 11

Statistical uncertainties are added in quadrature with the systematic uncertainties to obtain the total uncertainty.

You do not discuss what are the important systematic at this point...should you add a reference ??? How are you adding the systematic uncertainties of the met model ?

=> Added the reference. In Met Model we have 14 different parameters for the resolution functions we varied this and got the differences from the default values for each parameters and added those in quadrature.

You did not define HT before arriving to figure 1
HT is defined later on in page 5

=> Done.

Page 4

Line 2

I would describe here some of the parameters of the model that you are considering otherwise Fig 2 and Fig 3 are difficult for the reader

=> We were asked to remove the detail. We are just following the same format as was published in the gg+Met PRD with 202/pb.

Page 5

"gets rid off of most" => reduces

=> Done.

"Cover the region shown in Figure 3" I think this statement should be made more precise. Maybe indicate that your limit covers a larger region a low lifetime. I would almost put here the text that you have in the caption of figure 3.

=> Done.

Page 6

You should describe the parameters of Figure 2 bottom. They are mentioned only in the reference 5 which is at the very beginning of the paper on page 1 and page 3.

=> Same questions as above. Maybe we can discuss.

Page 7

How does figure 3 come out in B&W ????

Is the shaded region described in caption clear??? Everything seems to be shaded. Note that the yellow does not come out at all in B&W so the observed exclusion region is not visible.

=> They look fine in B&W. We explicitly checked and used the same color scheme as in the delayed photon PRL/PRD. See ref. [15] in the draft.