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Glue to light signal of a new particle

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Any new particle charged under $SU(3)_C$ and carrying electric charge will leave an imprint in the di-photon invariant mass spectrum as it can mediate $gg \rightarrow \gamma\gamma$ process through loops.

The combination of properties of loop functions and gluon pdfs results in a peak-like feature in the di-photon invariant mass around twice the mass of a given particle.

Using recent ATLAS analysis, we set upper limits on the combined $SU(3)_C$ and electric charge of new particles and indicate future prospects.

We briefly discuss the possibility that the excess of events in the di-photon invariant mass spectrum around 750 GeV originates from loops of a particle with mass around 375 GeV.

Summary

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