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Flares on minute time-scale in Blazars by mirroring plasmoids

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Bright and fast gamma-ray flares have been recently detected from
the Blazar 3C 279, with GeV luminosities up to 10^49 erg/s.
The source is observed to
flicker on timescales of minutes
with no comparable optical-UV counterparts. Such observations
challenge current models of high-energy emissions from Blazar sources that are dominated by relativistic
jets along our line of sight with bulk Lorentz factors up to
Gamma \sim 20$.
We discuss a model based on a jet structure comprising strings of plasmoids as indicated by many radio observations.
We follow the path of the
Synchrotron radiations emitted in the optical - UV bands by relativistic electrons accelerated around the plasmoids to isotropic Lorentz factors gamma \sim 10^3. These primary emissions are partly reflected back by a leading member in the string
that acts as a moving mirror for the approaching companions.
In the inter-plasmoid, shrinking gaps
transient overdensities of
seed photons build up.
The electrons then proceed to upscatter these seeds into
the GeV range by the inverse Compton interactions. We show that
such a combined process produces bright gamma-ray flares
with little or none optical to X-ray enhancements. Main features of
our model include: gamma-ray flares produced beyond the
broad line region; Compton dominance at GeV energies by factors
up to some 10^2; bright flares with risetimes as short
as a few minutes, occurring at distances of order 10^18 cm
from the central black hole; little reabsorption from local
photon-photon interactions.

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