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Thesis Title	*Modelling Quasar Flares*
Supervisor	A. Mastichiadis, Professor
Summary	Flat Spectrum Radio Quasars (FSRQs), a sub class of Blazars, are strong emitters of electromagnetic radiation, with jets pointing close to our line of sight, strong broad emission lines and a rapid variability ranging from minutes to several hours. Quasar 3C279 is one of the most extensively studied FSRQs. In June 2015 the source underwent a giant outburst with a minute scale variability that was observed by Fermi Large Area Telescope. In this project we investigate whether a one-zone proton synchrotron model could describe the origin of the observed GeV flare. Specifically we assume that high energy photons are produced by relativistic protons whose distribution is a Log Parabolic function. We find that a Log Parabolic distribution is preferred in this case over a Power Law as it produces a better fit to the observational data and it minimizes the total jet power. In order to explain the fast variability, we assume a small emitting region (Rblob∼10^14 cm), which is fast moving with Doppler factors greater than δ=50. The gamma rays are assumed to be produced at the outer edge of the Broad Line Region in order to prevent their absorption on soft photons. Finally, the total jet power is calculated to be about one order of magnitute greater than the Eddington Luminosity of the source while the particles and magnetic fields are found to be in rough equipartition.
Key words	Blazar, hadronic model, synchrotron emission, Log Parabolic distribution, photon photon absorption
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