



# Particle Acceleration by Magnetic Reconnection in AGNs and in the IGM

Elisabete M. de Gouveia Dal Pino, Grzegorz Kowal, Alex Lazarian, Reinaldo Santos-Lima

(Submitted on 13 Jul 2011)

There is no single mechanism by which fast particles are accelerated in astrophysical environments, and it is now recognized that the data require a rich variety of different mechanisms operating under different conditions. The mechanisms discussed in the literature include varying magnetic fields in compact sources, stochastic processes in turbulent environments, and acceleration behind shocks. An alternative, much less explored mechanism so far, involves particle acceleration within magnetic reconnection sites. In this work, we explore this mechanism in the AGN framework and show that particles are efficiently accelerated through a first-order Fermi process and have an exponential growth of energy. We also address briefly the propagation of cosmic rays (CRs) in the intergalactic medium (IGM). Since the latter is a collisionless environment, kinetic effects must be considered which will affect the turbulent magnetic field distribution and therefore, the CR propagation.

Comments: 6 pages, 3 figures, Proceedings of Science, AGN Physics in the CTA Era (AGN011)

Subjects: **High Energy Astrophysical Phenomena (astro-ph.HE)**; Cosmology and Extragalactic Astrophysics (astro-ph.CO)

Cite as: [arXiv:1107.2674](#) [astro-ph.HE]  
(or [arXiv:1107.2674v1](#) [astro-ph.HE] for this version)

## Submission history

From: Reinaldo Santos de Lima [[view email](#)]  
[v1] Wed, 13 Jul 2011 20:45:13 GMT (486kb)

[Which authors of this paper are endorsers?](#)

Link back to: [arXiv](#), [form interface](#), [contact](#).

## Download:

- [PDF only](#)

Current browse context:

astro-ph.HE

[< prev](#) | [next >](#)

[new](#) | [recent](#) | [1107](#)

Change to browse by:

[astro-ph](#)

[astro-ph.CO](#)

## References & Citations

- [INSPIRE HEP](#)  
([refers to](#) | [cited by](#))
- [NASA ADS](#)

## Bookmark (what is this?)

