Physics > Plasma Physics

An exact solution of the moving boundary problem for the relativistic plasma expansion in a dipole magnetic field

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(Submitted on 4 Apr 2012)

An exact analytic solution is obtained for a uniformly expanding, neutral, highly conducting plasma sphere in an external dipole magnetic field with an arbitrary orientation of the dipole moment in the space. Based on this solution the electrodynamical aspects related to the emission and transformation of energy have been considered. The results obtained can be used to treat qualitatively experimental and simulation data, and several phenomena of astrophysical and laboratory significance.

Comments:	11 pages, 2 figures. arXiv admin note: substantial text overlap with arXiv:physics/0603239 and arXiv:1007.0250
Subjects:	**Plasma Physics (physics.plasm-ph)**; Mathematical Physics (math-ph); Space Physics (physics.space-ph)
Cite as:	**arXiv:1204.0874 [physics.plasm-ph]**
	(or **arXiv:1204.0874v1 [physics.plasm-ph]** for this version)

Submission history

From: Hrachya Nersisyan [view email]
[v1] Wed, 4 Apr 2012 06:34:47 GMT (103kb)

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