

Study of magnetic field topology of toroidal plasma

Abstract

The cross-sectional size of plasma column has a significant impact on the surrounding magnetic field, especially at the vicinity of the plasma. In our previous studies, we have explored a distinct pattern of magnetic field topology at the surrounding area of plasma column, though the analytical approach to the observed magnetic topology is yet to address. Moreover, the radial profiling of toroidal current density makes the problems even more interesting.

In this project, we will start by addressing our previously established impactful numerical outcomes and their significances in practical Tokamak plasma scenarios. Further, we will aim to address a fair comparison between a filamentary and non-filamentary toroidal current. This will help to characterize the magnetic topology due a toroidal current, having radial current density profile and will end up by deriving analytical forms of these outcomes. The formalism of the entire derived equations will be aimed to be reduced into simplified forms that will enable for the validation with respect to well-available literature as well as measured data.

Academic Project Requirements:

1) Required No. of student(s) for academic project: 1

2) Name of course with branch/discipline: B.Sc. Physics

3) Academic Project duration:

(a) Total academic project duration: 26 Weeks

(b) Student's presence at IPR for academic project work: 2 Full working Days per week

Email to: suman.aich@ipr.res.in [Guide's e-mail address] and
project_phy@ipr.res.in [Academic Project Coordinator's e-mail address]

Phone Number: 079 -07923962248 [Guide's phone number]