

Integrated Data Analysis of the DIII-D Density Profile

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Abstract

1 Introduction

Introstuff [1]

2 Integrated Data Analysis

stuff

2.1 Bayesian basics

stuff

2.2 Mathematical Formulation

stuff

2.3 Principle of Maximum Entropy

stuff

2.4 Combining of multiple diagnostics

stuff

3 Forward modeling of density diagnostics

stuff

3.1 Functional form of the density profile

stuff

3.2 Inteferometry

stuff

3.3 Reflectometry

stuff

3.4 Thomson scattering

stuff

3.5 Beam emission spectroscopy

stuff

4 Likelihood and prior probabilities

stuff

4.1 Priors

stuff

4.1.1 Parameter space priors

stuff

4.1.2 Data space priors

stuff

4.2 Likelihoods

stuff

4.2.1 Interferometry

stuff

4.2.2 Reflectometry

stuff

4.2.3 Thomson scattering

stuff

4.2.4 Beam emission spectroscopy

stuff

4.2.5 Combined likelihood probability

stuff

5 Total posterior probability

stuff

5.1 Exploring the posterior

stuff

6 Representation of Error

stuff

7 Density profile reconstructions

stuff

7.1 H-mode reconstruction

stuff

7.2 L-mode reconstruction

stuff

8 Conclusions and future work

stuff

References

- [1] Devinderjit Sivia and John Skilling. *Data analysis: a Bayesian tutorial*. Oxford University Press, USA, 2006.