Guariguanchi Short Manual

A. Pérez Pérez a

a) Université de Strasbourg / CNRS, IPHC, 23 rue du Loess 67037 Strasbourg, France

November 2017

Abstract

Bla Bla Bla

Contents

1	Introduction						
	1.1	What is Guariguanchi?					
	1.2	General philosofy					
2	Getting Started						
	2.1	Installation					
	2.2	Playing with some examples					
		2.2.1 Beam test					
		2.2.2 Simple vertex detector tracker					
		2.2.3 ILC vertex detector tracker					
		2.2.4 Other configurations					
3	Guariguanchi's class structure						
	3.1	Global tools class					
	3.2	Geometry element classes					
		3.2.1 Surface classes					
		3.2.2 Implementing a new geometry element class					
	3.3	B-field classes					
		3.3.1 Implementing a new B-field class					
	3.4	Resolution model class					
		3.4.1 Implementing a new resolution model class					
	3.5	Geometry class					
	3.6	Trajectory classes					
		3.6.1 Equation of motion and track parameterization					
		3.6.2 Implementing a new Trajectory class					
	3.7	Tracker class					
		3.7.1 Track intersections with geometry					
		3.7.2 Track parameters covariance matrix calculation					
		3.7.3 Space points covariance matrix calculation					
		3.7.4 Material budget calculation					
		3.7.5 Pseudo-efficiency calculation					
	3.8	Guariguanchi class (main class)					
4	Gua	Guariguanchi configuration					
	4.1	Main datacard					
		4.1.1 Material budget analysis					
		4.1.2 Track parameters resolution vs (p, θ, ϕ)					
		4.1.3 Pseudo-efficiency vs (p, θ, ϕ)					
	4.2	Geometry datacard					
		4.2.1 World volume					
		4.2.2 Geometry B-field					

6	Acknowled	dgements	7
5	Summary	and outlook	7
	4.2.7	Track cuts	7
		Resolution model	
		Mosaic geometries	
		Ladder geometries	
	4.2.3	Simple geometries	6

1 Introduction

1.1 What is Guariguanchi?

A b

1.2 General philosofy

fff

2 Getting Started

dd

2.1 Installation

dd

2.2 Playing with some examples

 $\mathrm{d}\mathrm{d}$

2.2.1 Beam test

dd

2.2.2 Simple vertex detector tracker

dd

2.2.3 ILC vertex detector tracker

dd

2.2.4 Other configurations

dd

3 Guariguanchi's class structure

dd

3.1 Global tools class ddGeometry element classes 3.2 dd3.2.1 Surface classes ddImplementing a new geometry element class 3.2.2 ddB-field classes 3.3 ddImplementing a new B-field class 3.3.1 ddResolution model class 3.4 ddImplementing a new resolution model class 3.4.1 dd3.5 Geometry class dd3.6 Trajectory classes ddEquation of motion and track parameterization 3.6.1 dd

3.6.2 dd	Implementing a new Trajectory class
3.7 dd	Tracker class
3.7.1 dd	Track intersections with geometry
3.7.2 dd	Track parameters covariance matrix calculation
3.7.3 dd	Space points covariance matrix calculation
3.7.4 dd	Material budget calculation
3.7.5 dd	Pseudo-efficiency calculation
3.8 dd	Guariguanchi class (main class)
4 (Guariguanchi configuration
4.1 ddd	Main datacard
4.1.1 ddd	Material budget analysis
4.1.2	Track parameters resolution vs (p, θ, ϕ)

ddd

4.1.3 Pseudo-efficiency vs (p, θ, ϕ) ddd
$\begin{array}{ccc} \textbf{4.2} & \textbf{Geometry datacard} \\ \textbf{dd} & \end{array}$
4.2.1 World volume
4.2.2 Geometry B-field dd
4.2.3 Simple geometries dd
Plane dd
Cylinder dd
Disk dd
Cone dd
Petal dd
4.2.4 Ladder geometries dd
Plane Ladder

dd

Cylinder Ladder

dd

4.2.5 Mosaic geometries

dd

Plane ladder mosaic

dd

Disk ladder mosaic

dd

4.2.6 Resolution model

dd

4.2.7 Track cuts

dd

5 Summary and outlook

Two

6 Acknowledgements

We are grateful \dots

References

[1] I. Valin et al., A reticle size CMOS pixel sensor dedicated to the STAR HFT, JINST 7 (2012) C01102.