

Development of a beam-based phase feed-forward
demonstration at the CLIC Test Facility (CTF3).

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Thesis submitted in fulfilment of the requirements for the degree of Doctor
of Philosophy at the University of Oxford

Trinity Term, 2016

Abstract

This is the abstract TeX for the thesis and the stand-alone abstract.

Dedication.

Acknowledgements

Acknowledgements.

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Item2 Description.

Item3 Description.

Chapter 1

Introduction

This is the introductory text.

1.1 Particle Accelerators

1.2 Motivation for Future Linear Colliders

1.3 FONT

1.4 CLIC

1.5 Phase Feedforward for CLIC

1.6 Thesis Overview

Chapter 2

CTF3 and the PFF Prototype

This is the introductory text.

2.1 CTF3

Goals

Machine layout

2.2 Goals for PFF at CTF3

2.3 Design of the PFF Prototype at CTF3

Location of hardware

available latency

2.4 PFF Hardware

FONT5 Board

Amplifier

Phase Monitors

Kickers

2.5 Differences Between PFF at CTF and CLIC

Chapter 3

Optics for the PFF Prototype

This is the introductory text.

3.1 TL2 Lattice

3.2 Optics Requirements

3.3 TL2 MADX Model

3.4 Matched PFF and Nominal Optics

Chapter 4

Phase Monitor Performance

This is the introductory text.

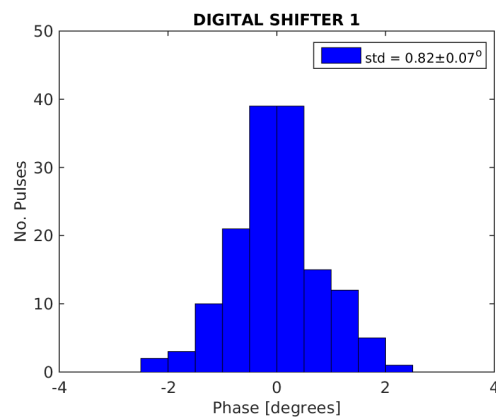


Figure 4.1: Dig shifter 1.

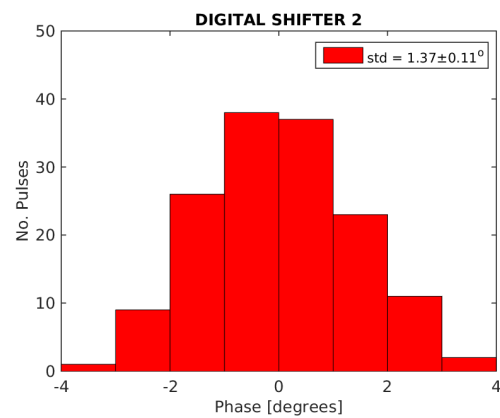


Figure 4.2: Dig shifter 2.

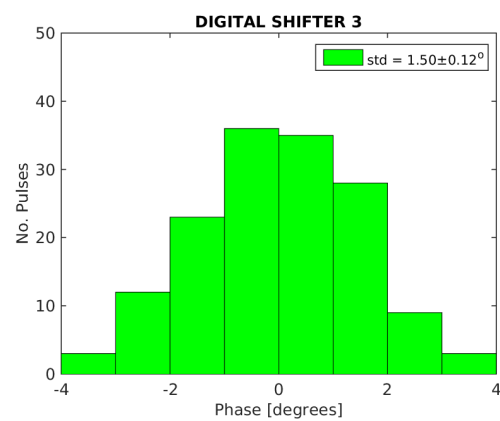


Figure 4.3: Dig shifter 3.

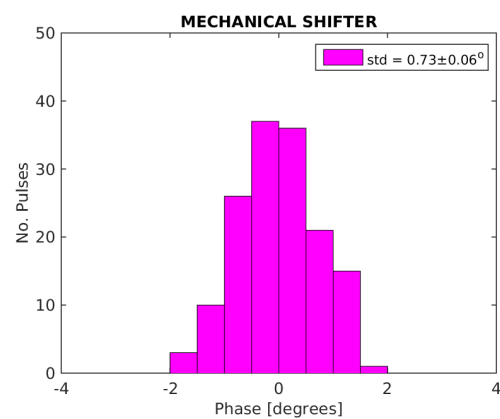


Figure 4.4: Mech shifter.

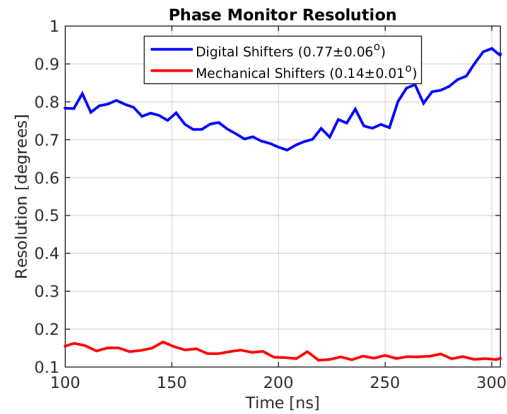


Figure 4.5: Resolution.

4.1 Phase Monitor Electronics

4.2 Signal Response Measurements

4.3 Calibrations

4.4 Digitiser Noise

4.5 Phase Shifter Noise

4.6 Resolution

4.7 Linearity and Bandwidth

4.8 Dependence on Position

Chapter 5

Phase Propagation

This is the introductory text.

5.1 Characteristics of Uncorrected Phase Jitter

5.2 First Order Energy Dependencies

5.3 Higher Order Energy Dependencies

5.4 Other Sources of Phase Jitter

5.5 Long Term Propagation Stability

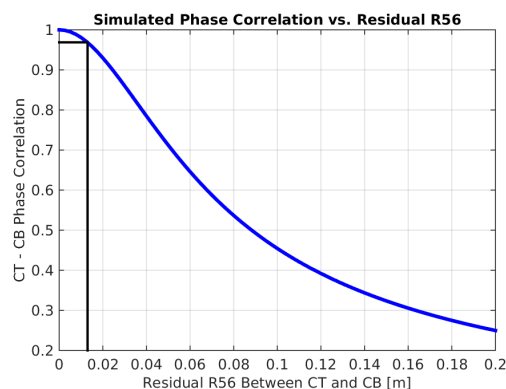


Figure 5.1: Phase correlation vs. residual R56 between monitors.

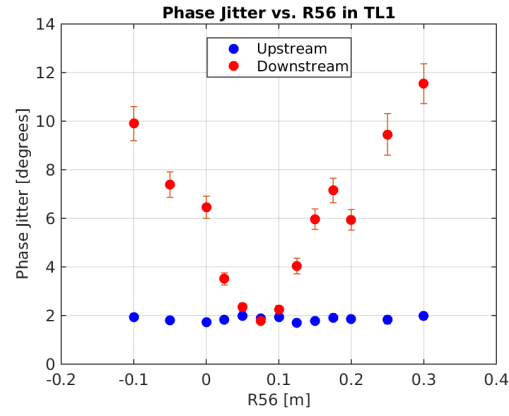


Figure 5.2: Phase jitter for different R56 whilst wiggling gun current.

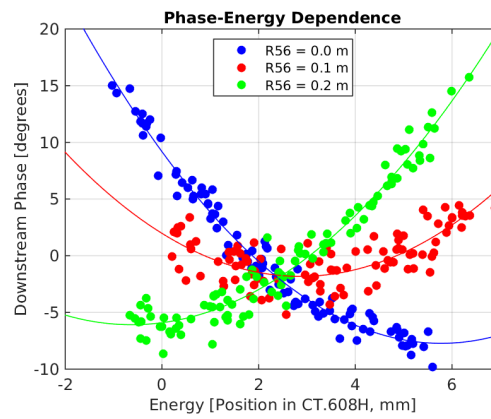


Figure 5.3: Phase vs. energy for different R56 in TL1.

Chapter 6

Simulated PFF Performance

This is the introductory text.

6.1 Theoretical Corrected Jitter and Optimal Gain

6.2 Simulations Using Beam Data

6.3 Effect of Limited Correction Range

6.4 Effect of Limited Correction Bandwidth

Chapter 7

Feedforward Results

This is the introductory text.

7.1 Gain Scans

7.2 Correction at Optimal Gain

7.3 Simulated PFF Results

7.4 Correction on Longer Timescales

7.5 Correction with Additional Jitter Source

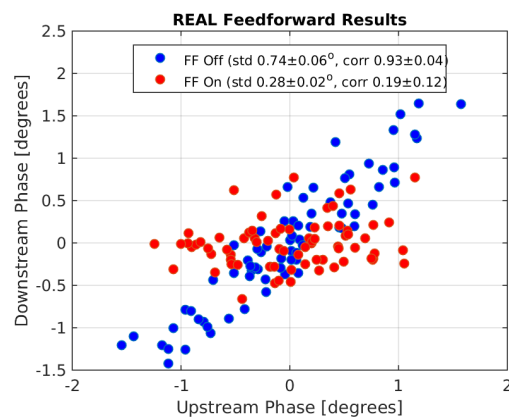


Figure 7.1: Mean phase.

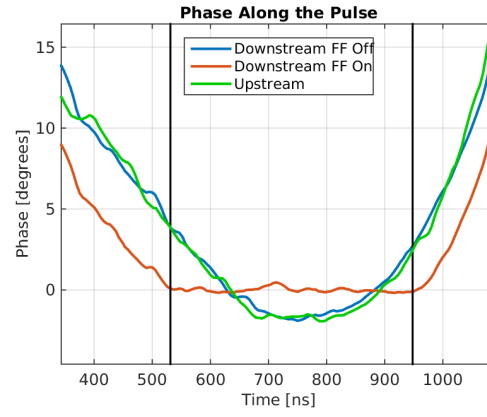


Figure 7.2: Mean phase along.

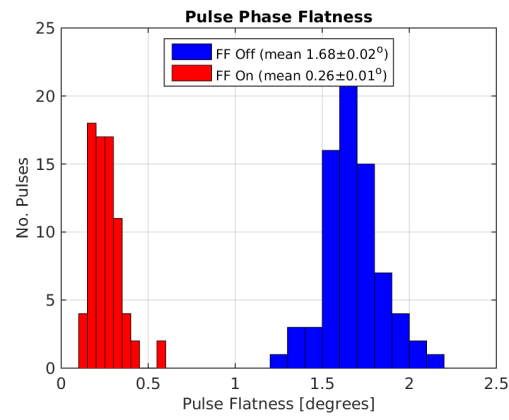


Figure 7.3: Flatness.

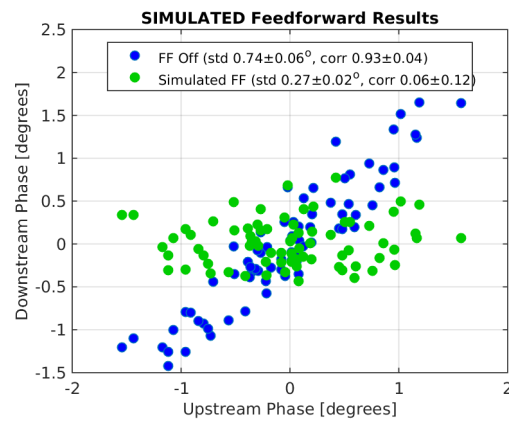


Figure 7.4: Simulated PFF.