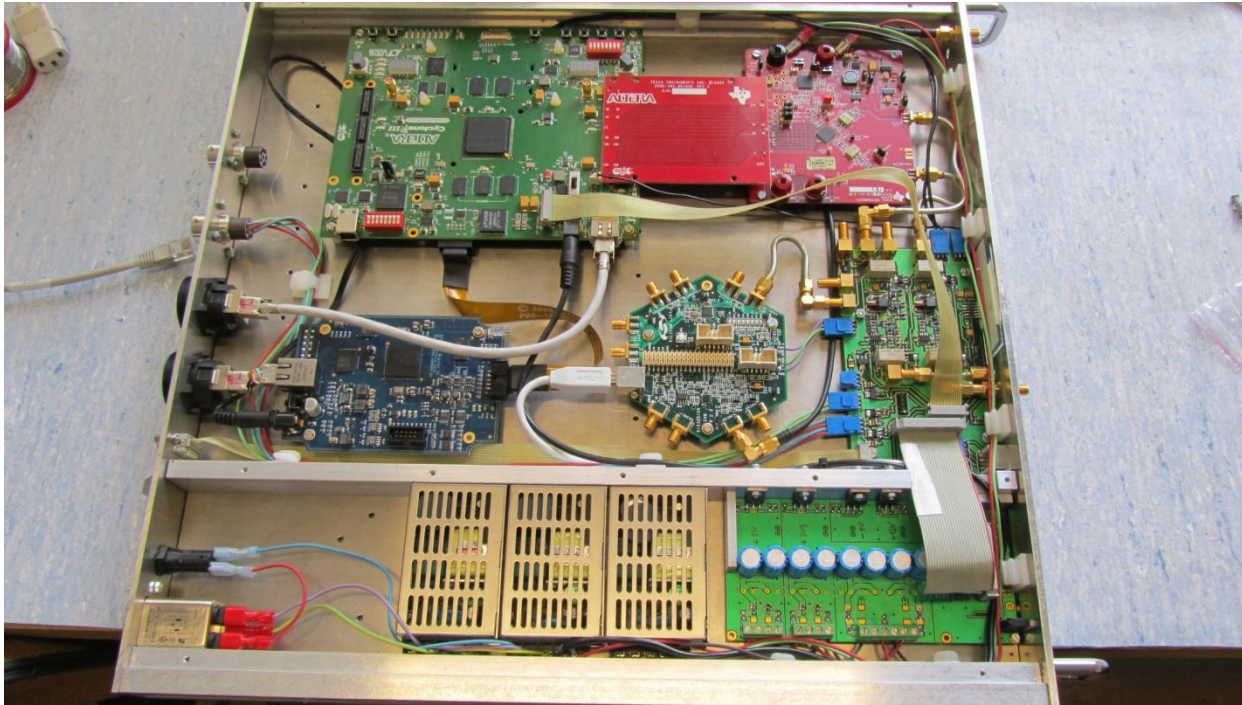


# DIDT SYSTEM



Sept 2011

Introduction

Theory

Specification

Implementation

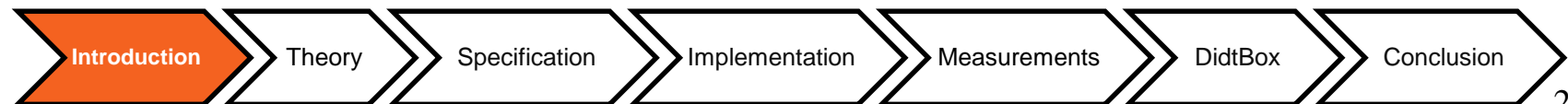
Measurements

DidtBox

Conclusion

# Summary

- Introduction
- Theory
- Specification
- Implementation
- Measurements
- DidtBox
- Conclusion

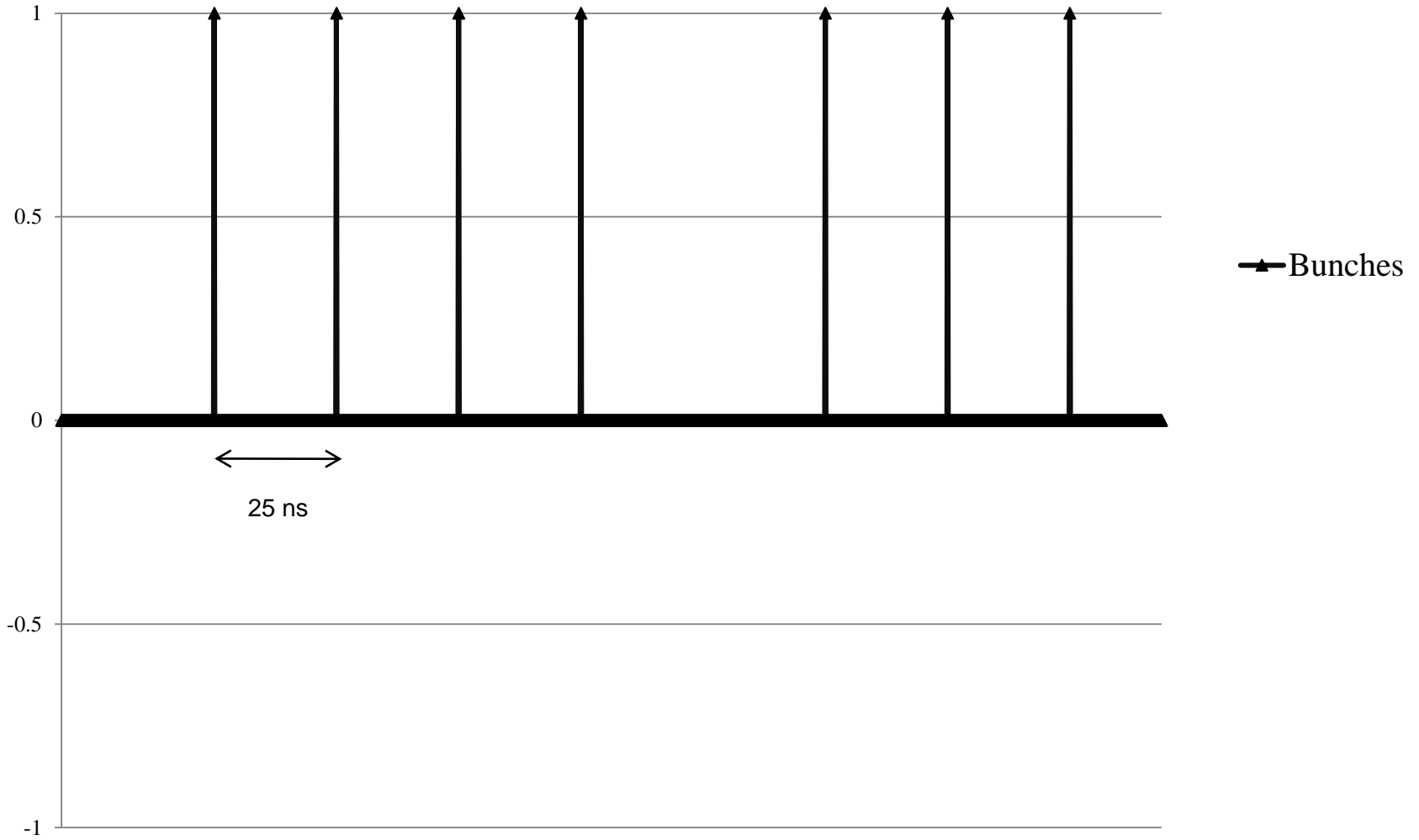


# Theory : Purpose

- Evaluate the loss of the BEAM using the beam intensity.
- Trigger the dumping when there is too much losses



# Theory



Introduction

**Theory**

Specification

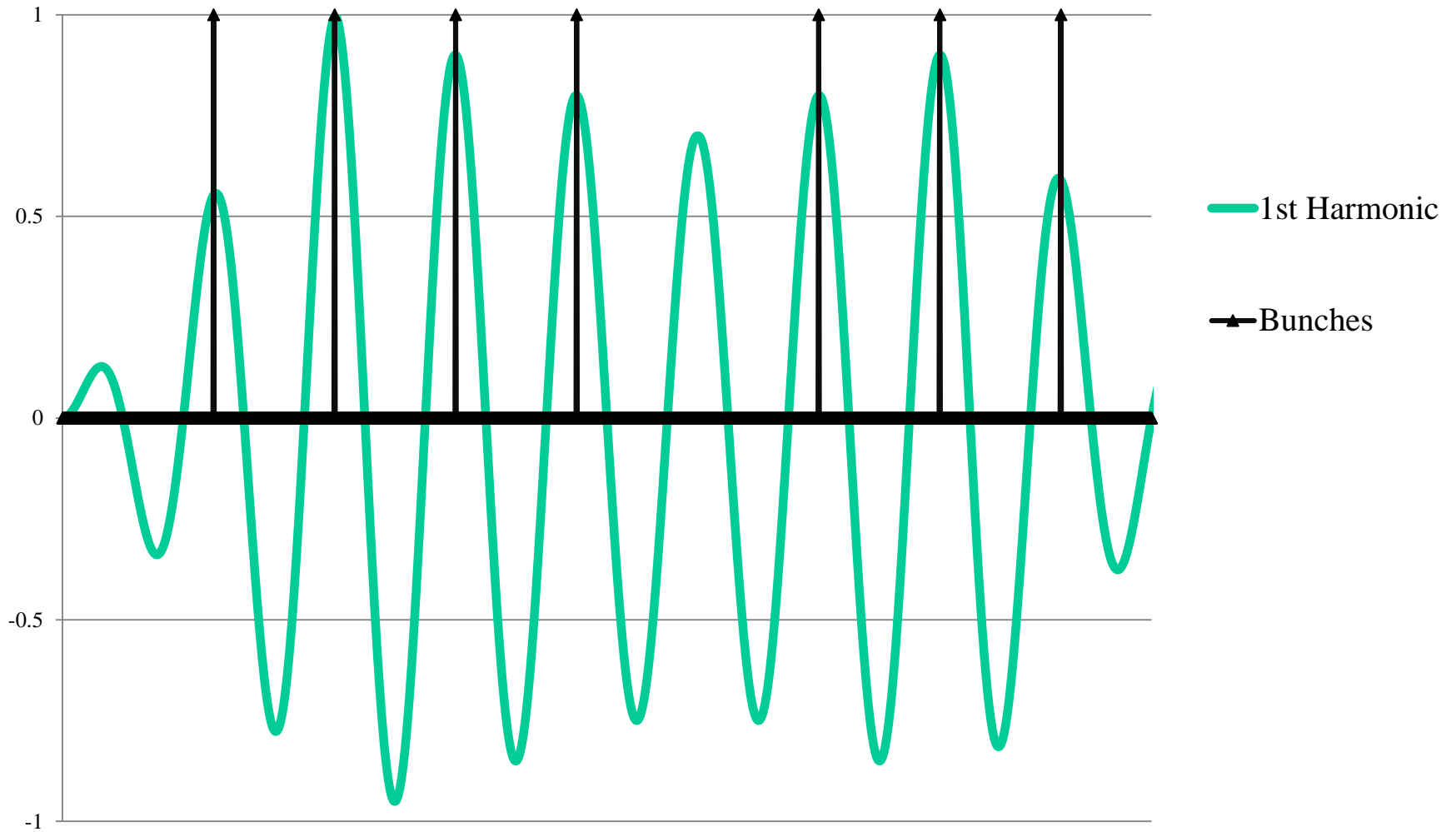
Implementation

Measurements

DidtBox

Conclusion

# Theory



Introduction

**Theory**

Specification

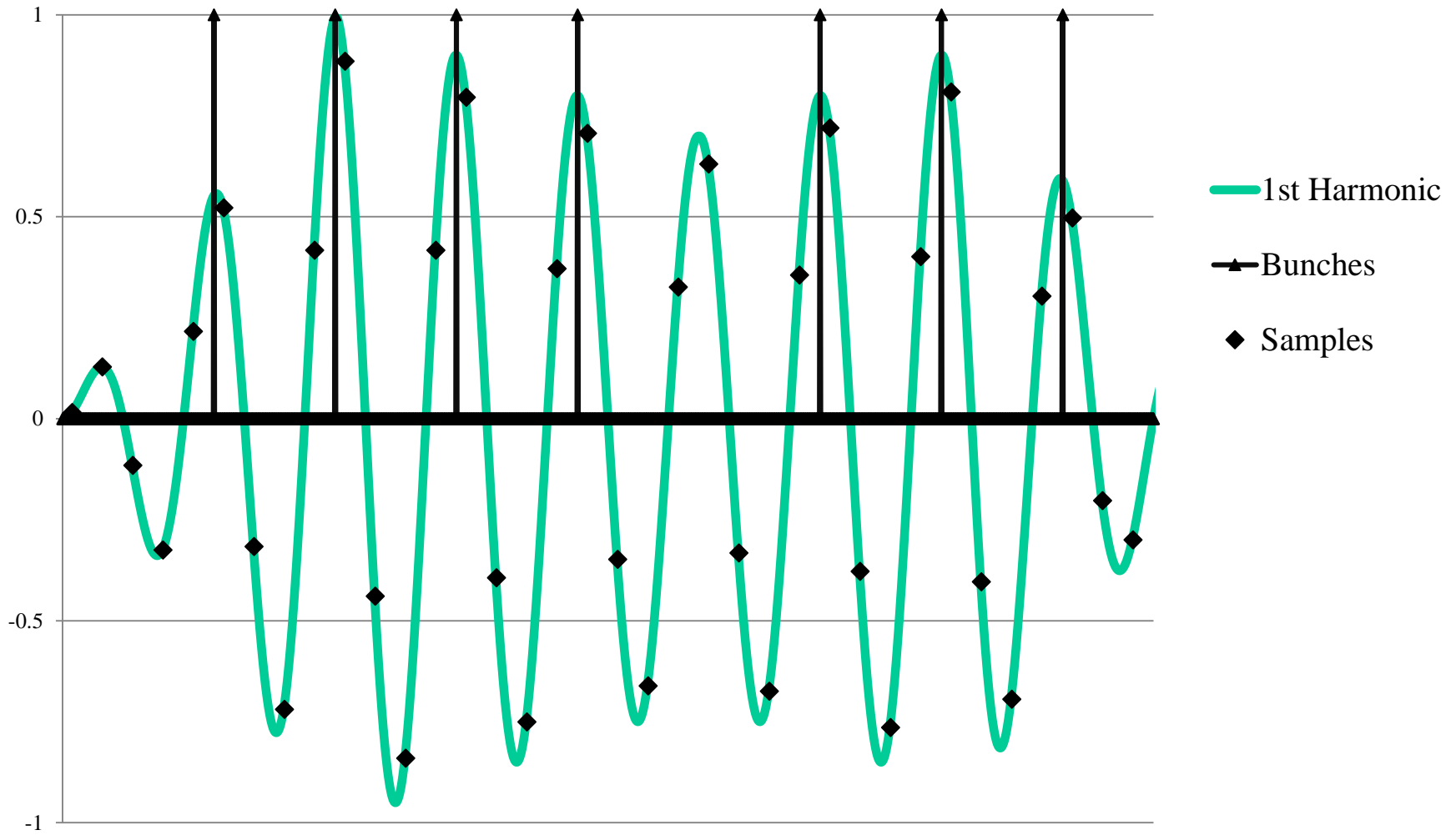
Implementation

Measurements

DidtBox

Conclusion

# Theory



Introduction

**Theory**

Specification

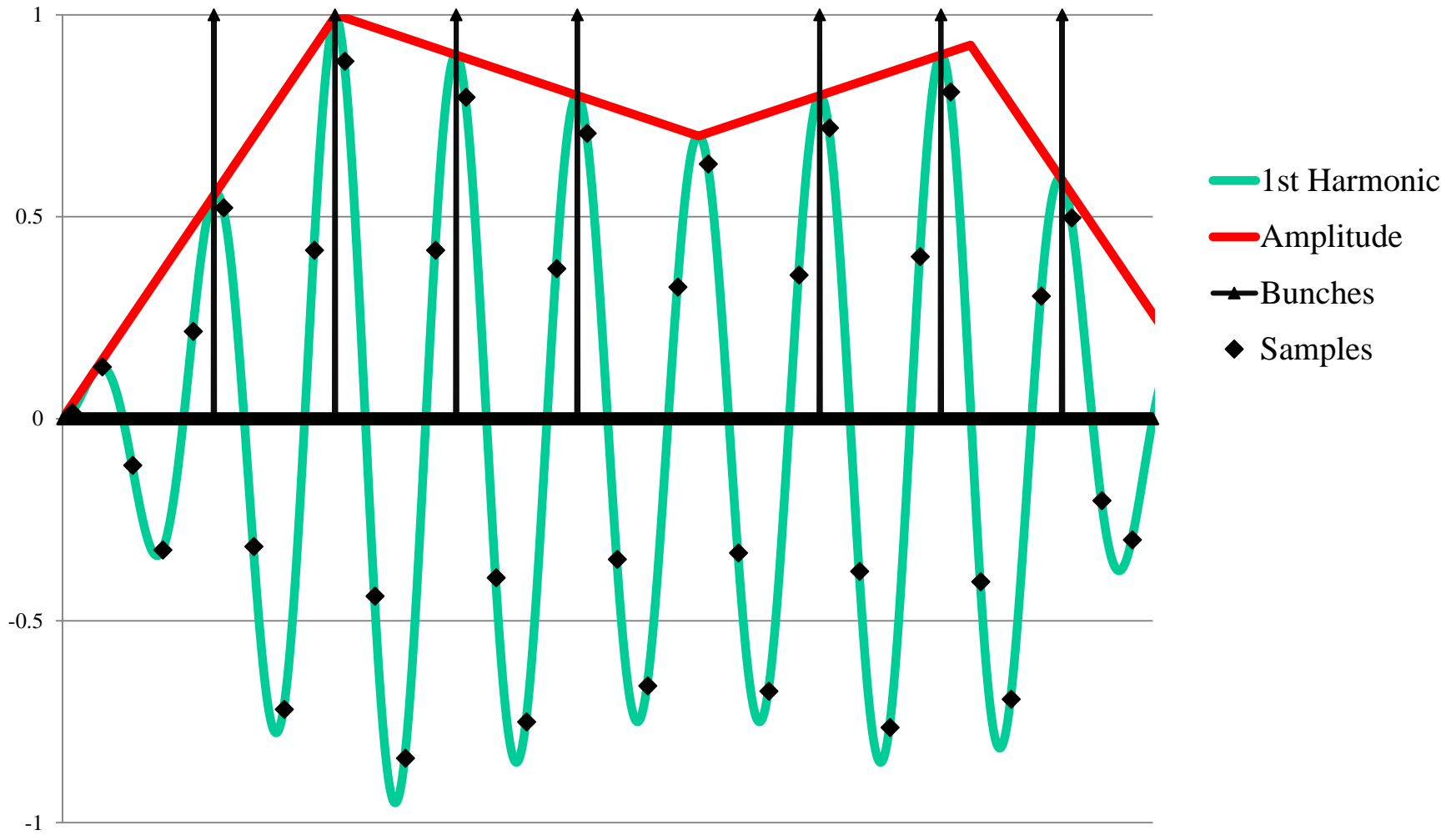
Implementation

Measurements

DidtBox

Conclusion

# Theory



Introduction

**Theory**

Specification

Implementation

Measurements

DidtBox

Conclusion

# Theory

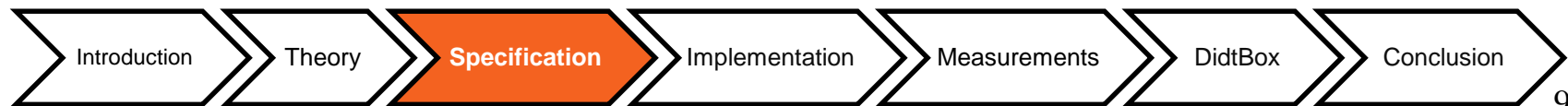
- Sum all the amplitudes during one turn
- Calculate the average for 1,4,16,64,256,1024 turns
- Calculate the loss for 1,4,16,64,256,1024 turns
- Compare the loss to threshold which are depending of energy



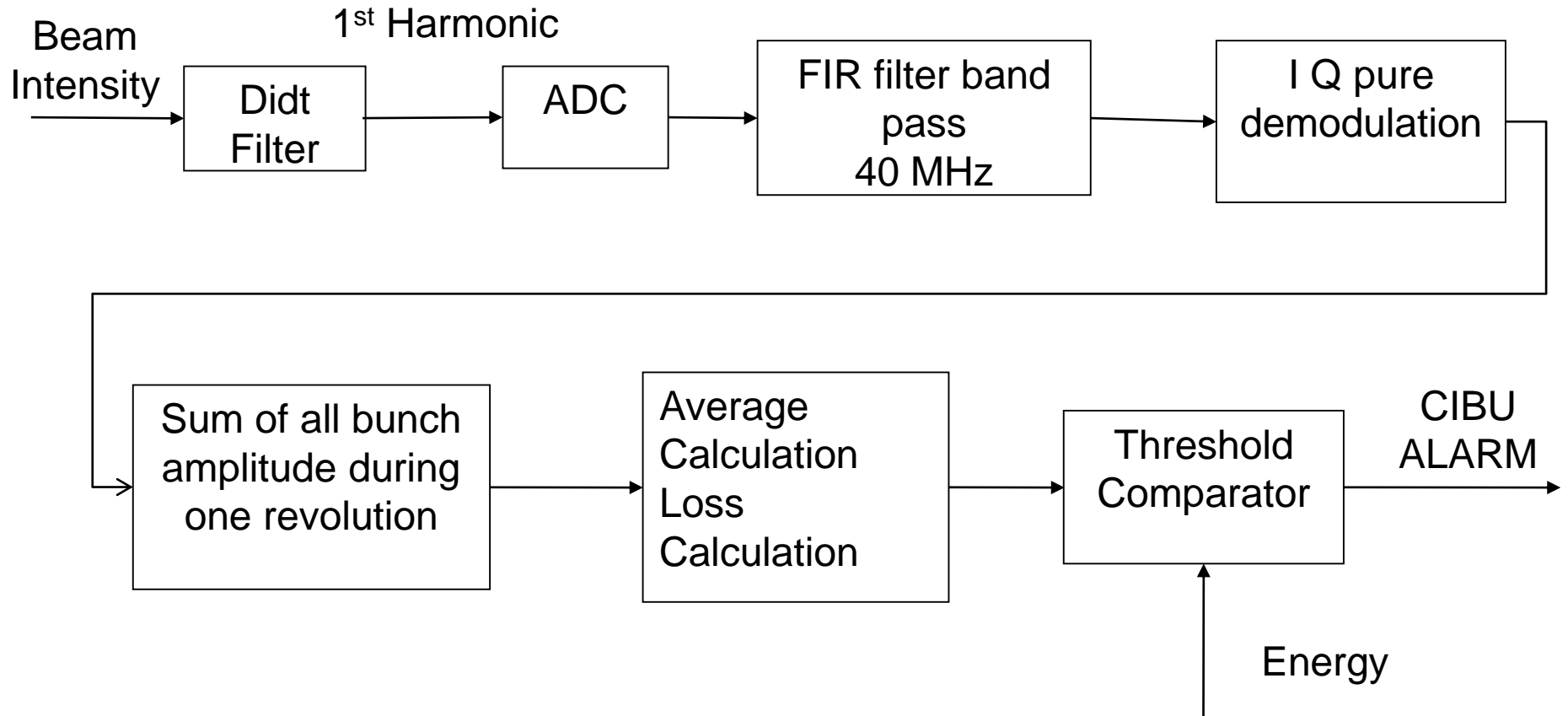


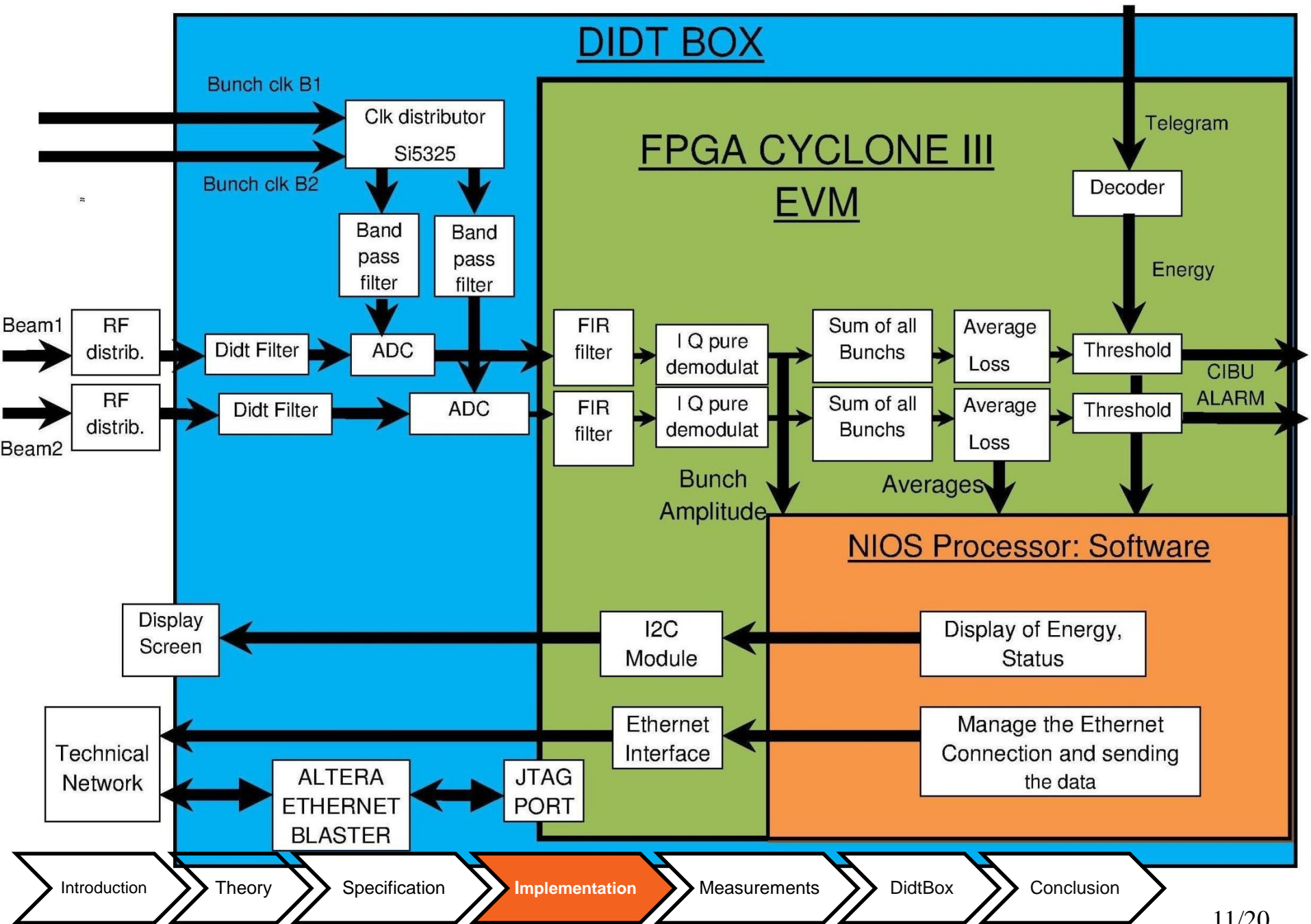
# Specification

- Box in aluminum (4x45x65mm)
- 2 Channels for BEAM1, BEAM2
- Critical part only in Hardware
- Acquisition of data by Ethernet
- Remote programming of the FPGA by Ethernet

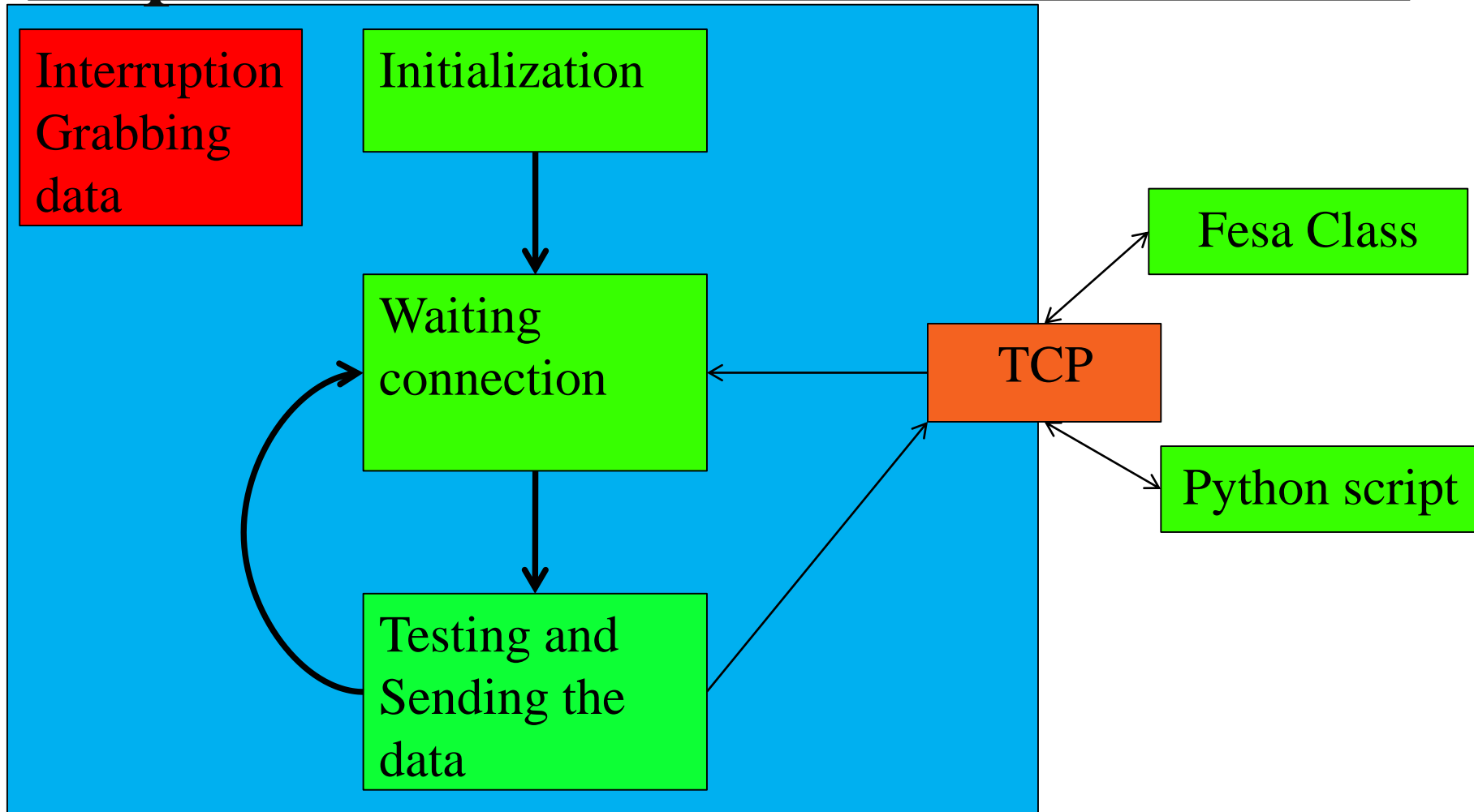


# Implementation

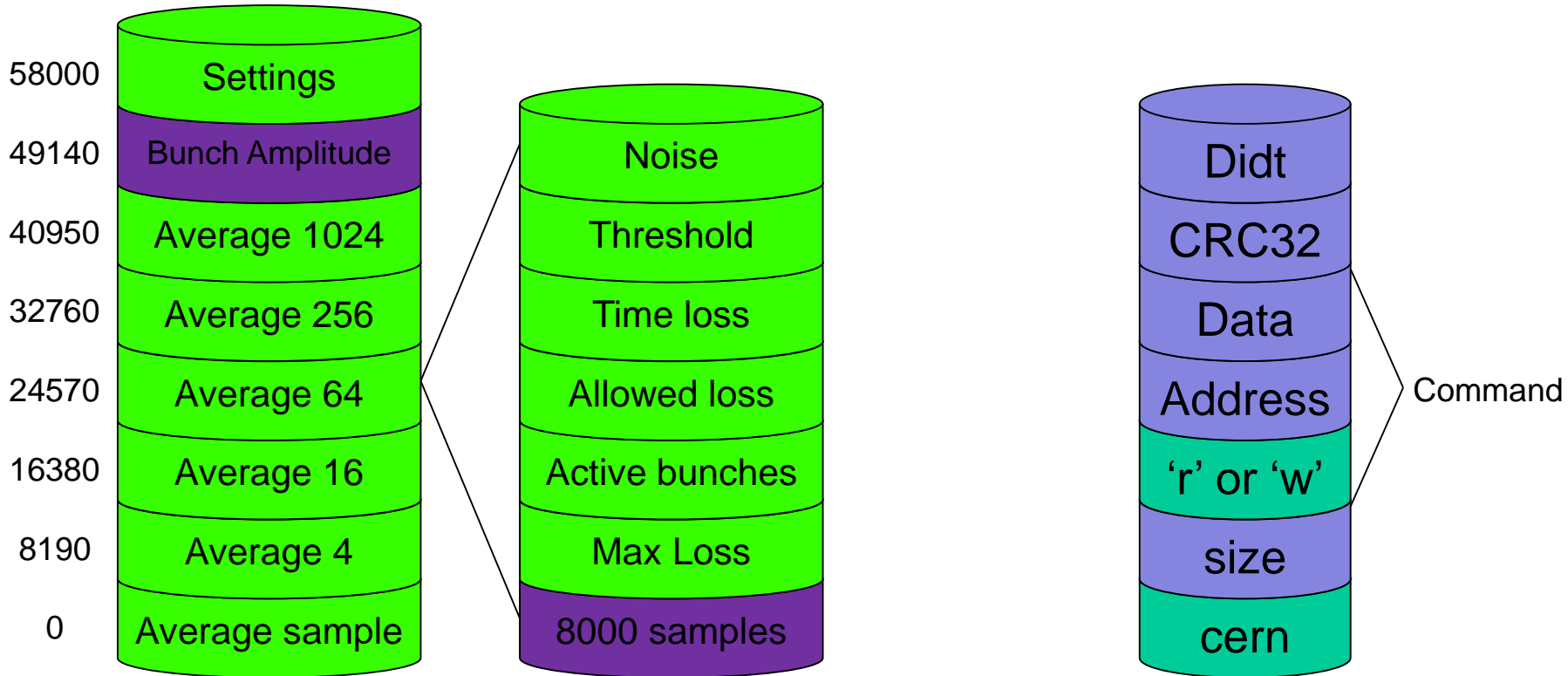




# Implementation : NIOS Software



# Implementation : Software



Memory Map

TCP Packet

Introduction

Theory

Specification

**Implementation**

Measurements

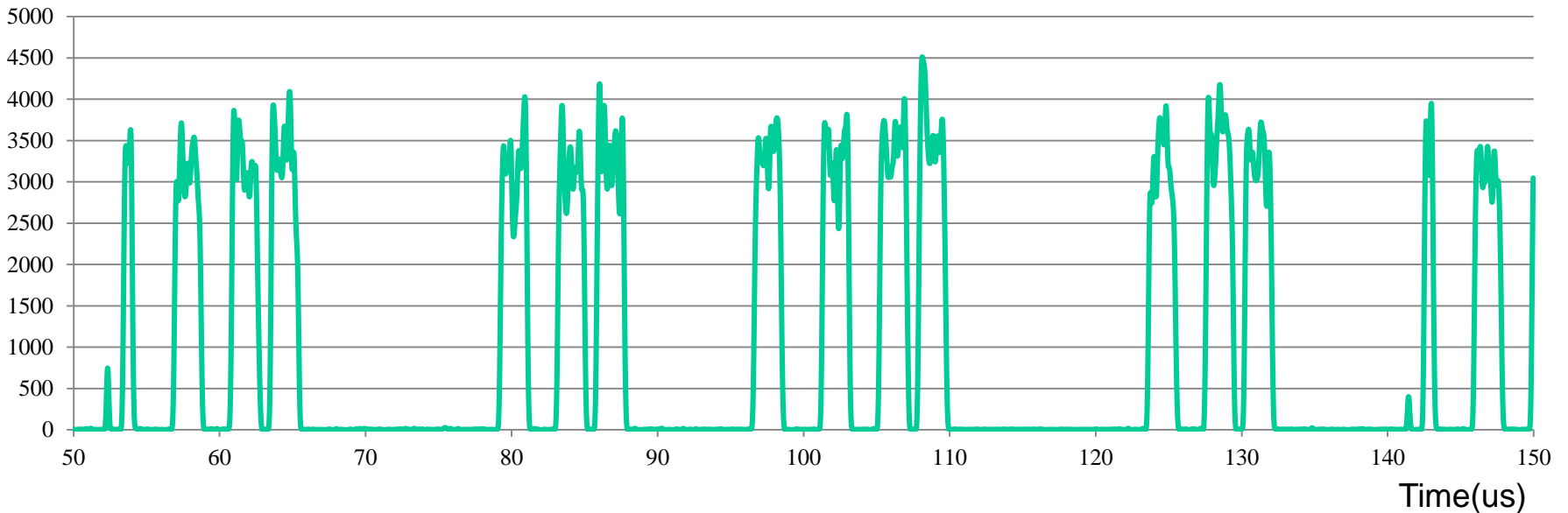
DidtBox

Conclusion

# Measurements

## Bunch Amplitude

Amplitude(bits)



1 revolution of LHC  $\approx$  90 us

Introduction

Theory

Specification

Implementation

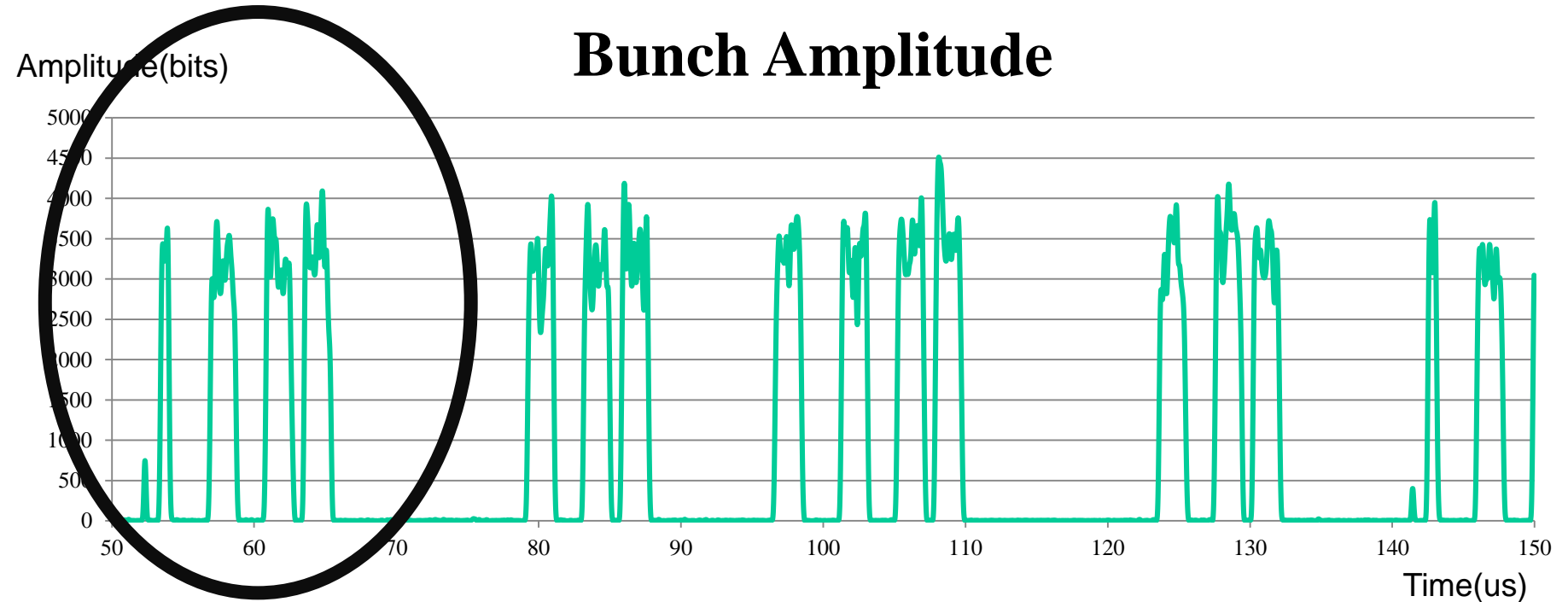
Measurements

DidtBox

Conclusion

# Measurements

## Bunch Amplitude



1 revolution of LHC  $\approx$  90 us

Introduction

Theory

Specification

Implementation

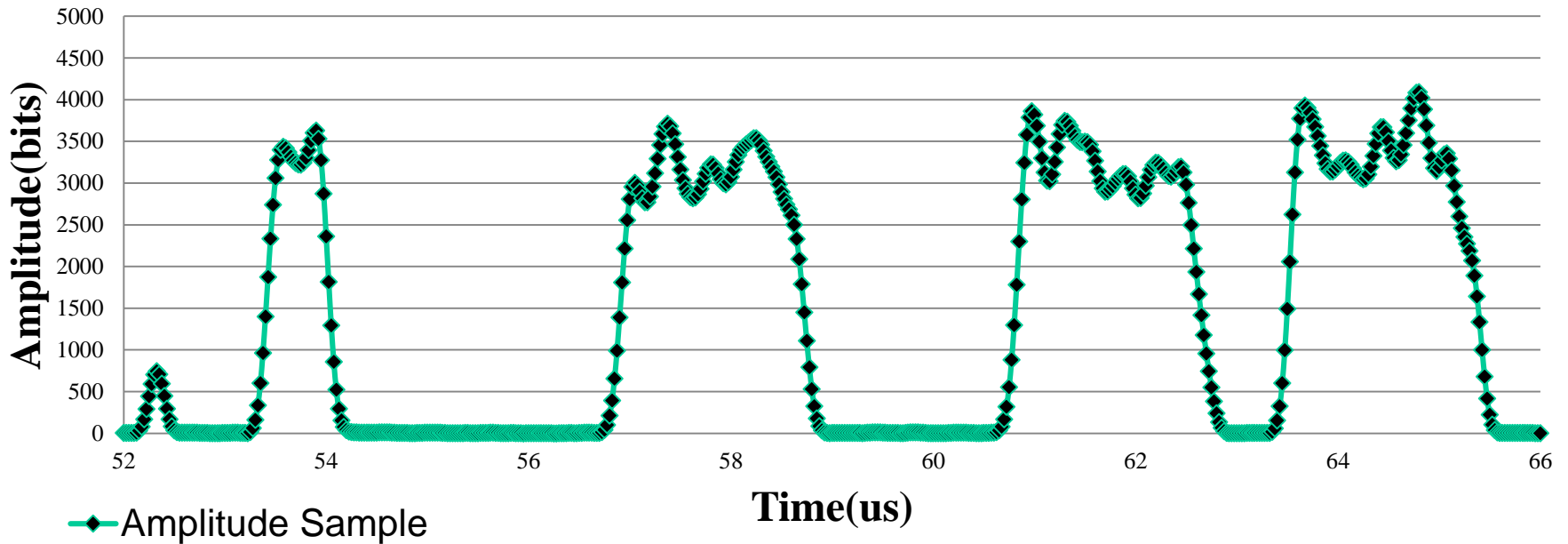
Measurements

DidtBox

Conclusion

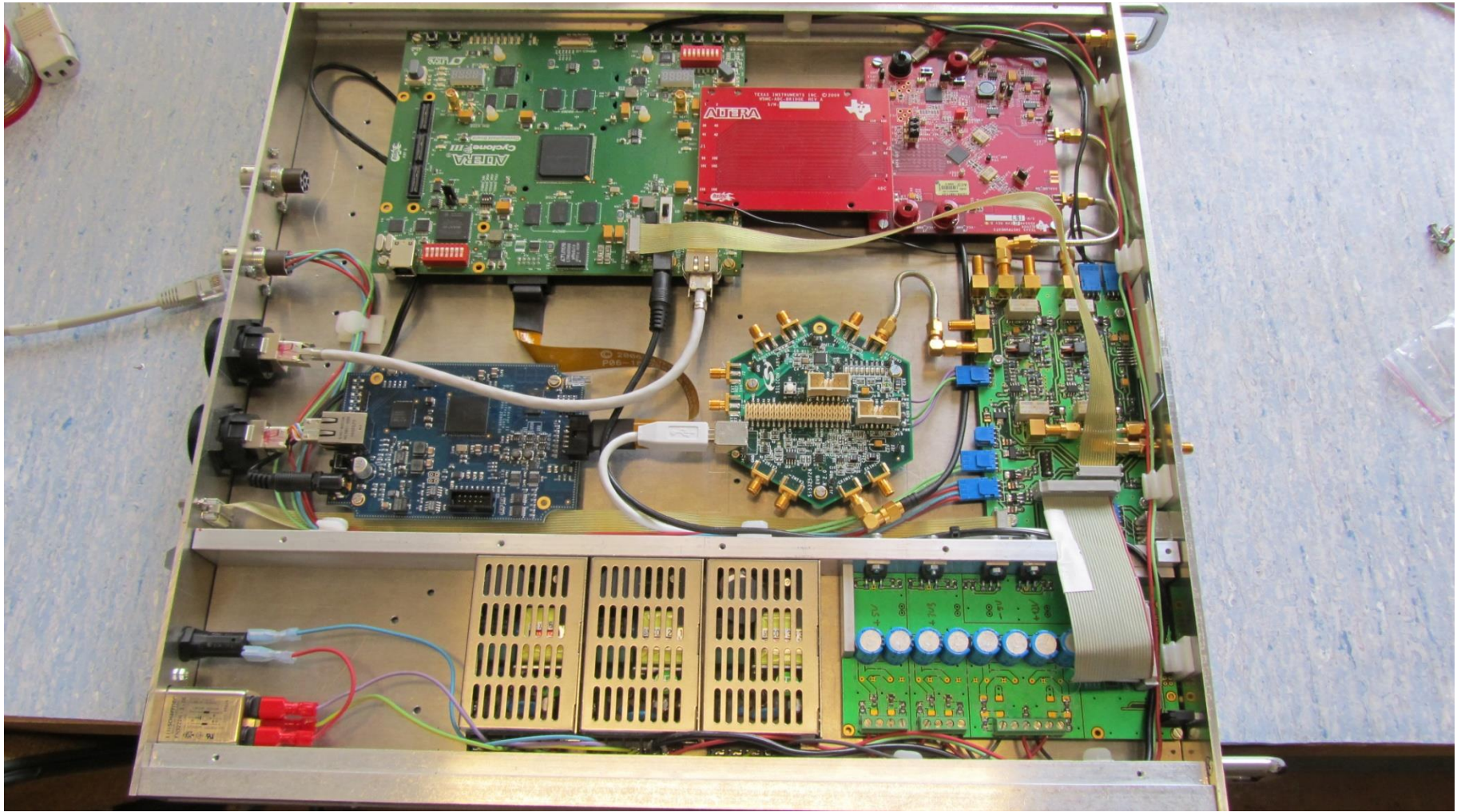
# Measurements

## Bunch Amplitude





# DIDT BOX



Introduction

Theory

Specification

Implementation

Measurements

**DidtBox**

Conclusion

# DIDT BOX



Introduction

Theory

Specification

Implementation

Measurements

**DidtBox**

Conclusion

# DIDT BOX



Introduction

Theory

Specification

Implementation

Measurements

**DidtBox**

Conclusion

# Planning

- Analyze the Bunch result using FESA class (1<sup>st</sup> October)
- Modified the FPGA firmware to add a second channel (15 October)
- Install two boxes. (7<sup>th</sup> November)
- Storage data in a timber database (End of November)
- Final System (February)



**THANK YOU FOR YOUR ATTENTION**  
**QUESTIONS?**