

IMPLEMENTATION AND ANALYSIS OF A FIELD PROGRAMMABLE ADC DESIGN FOR THE INTERFACING OF FPGAS

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Declaration of Authorship



Abstract



Zusammenfassung



Acknowledgements



1 Introduction and Motivation

1.1 Motivation

1.2 Literature review

1.3 Problem Description



2 Theory of ADCs

2.1 Different ADC Architectures

2.2 Measurement parameters

2.3 Theory of Oversampling



3 System Overview



4 ADC design

4.1 Design Specifications

4.2 State Diagrams Explained

4.2.1 Counter ADC

4.2.2 Tracking ADC

4.2.3 SAR ADC

4.2.4 Comparative Analysis of Counter,Tracking and SAR ADC



5 Digital Post Calibration

5.1 Moving Average Filter

5.1.1 Analysis and Implementation of Moving Average in FPGA

5.1.2 Moving Average with Floating Point Unit in FPGA

5.1.3 Efficient Implementation of Moving Average in FPGA using CIC

CIC as Moving Average-Proof of Concept

5.1.4 Moving Average with CIC performance Analysis

5.1.5 Illustration of Traditional tracking ADC and Moving Average



6 Evaluation and Results



7 Conclusion and Outlook

7.1 Conclusion

7.2 Outlook



8 Bibliography