# R&D OF A HIGH-PERFORMANCE DIRC DETECTOR FOR USE IN AN ELECTRON-ION COLLIDER

by

S. Lee Allison MS in Physics

A Dissertation Submitted to the Faculty of Old Dominion University in Partial Fulfillment of the Requirements for the Degree of

DOCTOR OF PHILOSOPHY

**PHYSICS** 

OLD DOMINION UNIVERSITY May 2017

Approved by:

Dr. Charles Hyde (Director)

Dr. Grzegorz Kalicy (Member)

member (Member)

#### ABSTRACT

# R&D OF A HIGH-PERFORMANCE DIRC DETECTOR FOR USE IN AN ELECTRON-ION COLLIDER

S. Lee Allison Old Dominion University, 2016 Director: Dr. Dr. Charles Hyde

text of abstract goes here

Copyright, 2016, by S. Lee Allison, All Rights Reserved.

#### ACKNOWLEDGEMENTS

#### TABLE OF CONTENTS

| Pa                             | ge  |
|--------------------------------|-----|
| LIST OF TABLES                 | vi  |
| LIST OF FIGURES                | vii |
| 1. DIRC TECHNOLOGY             | 1   |
| Chapter                        |     |
| BIBLIOGRAPHY                   | 2   |
| APPENDICES A. ERROR EVALUATION | 3   |
| VITA                           | 4   |

# LIST OF TABLES

Table Page

## LIST OF FIGURES

Figure Page

#### CHAPTER 1

#### DIRC TECHNOLOGY

[2]

- 1.1 APPLYING THE CHERENKOV EFFECT TO PARTICLE ID
- 1.2 DIRC DETECTORS

#### **BIBLIOGRAPHY**

- [1] A. Accardi et al, Electron Ion Collider: The Next QCD Frontier Understanding the glue that binds us all (arXiv:1212.1701v3 [nucl-ex]).
- [2] B. M. Bolotovskii, Vavilov-Cherenkov radiation: its discovery and application. Physics-Uspekhi 52 (11): 1099.

#### APPENDIX A

#### ERROR EVALUATION

## VITA

S. Lee Allison Department of Physics Old Dominion University Norfolk, VA 23529

The text of the Vita goes here.