

Contents

Version 1.1, May 2009

Preface	1
Handbook Structure	2
Handbook Updates	3
Source Material & Attribution	3
Chapter 1	
Introduction to NOAO Data	1-1
1.1 NOAO Data Holdings	1-1
1.1.1 Data Sources	1-2
1.1.2 Processing Levels	1-3
1.1.3 Types of Data Products	1-4
Science Data	1-4
Metadata	1-5
Calibration Data	1-6
Concomitant Data	1-6
Ancillary Data	1-6
1.1.4 Data File Nomenclature	1-7
1.2 NOAO Data Formats	1-8
1.2.1 Imaging Data	1-8
1.2.2 Spectroscopic Data	1-9
1.2.3 Concomitant Data	1-9
1.2.4 Ancillary Data	1-10
1.3 Accessing NOAO Data	1-10
1.3.1 User Registration and Login	1-10
1.3.2 VO Portal Interface	1-12
1.3.3 Obtaining Data via the Portal	1-13
Retrieve Nonproprietary Science Data	1-14
Obtain Data from an Observing Run	1-19
Obtain Calibration Reference Files	1-22
1.4 Data Use Policy	1-25
1.4.1 Proper Citation for NOAO Data	1-25

1.4.2 Referencing Datasets in Journals	1-26
1.5 References & Further Information	1-26
Contributing Authors	1-26
References	1-27
For Further Reading	1-27

Chapter 2

Mosaic Cameras..... 2-1

2.1 Instrument Overview	2-1
2.1.1 Instrument Capabilities & Design	2-2
Focal Plane	2-4
Operations	2-6
2.2 Data Products	2-7
2.2.1 Image Formats	2-8
Raw Data	2-8
Calibrated Data	2-10
2.2.2 Header Keywords	2-12
2.2.3 Environmental Data	2-14
2.3 Calibration	2-15
2.3.1 Processing Steps	2-15
Artifact Flagging	2-17
Cross-Talk Correction	2-17
Bias Correction	2-18
Dark Correction	2-18
Pupil Ghost Correction	2-18
Fringe Pattern Correction	2-19
Flat-Field Correction	2-20
World Coordinate System Calibration	2-20
Photometric Calibration	2-21
Image Re-projection	2-22
Image Stacking	2-22
2.3.2 Calibration Reference Files	2-23
Bias Structure	2-24
Dome Flat-Field	2-24
Pupil Ghost	2-25
Fringe Pattern	2-25
Sky Delta-Flat	2-26
2.4 Sources of Error	2-27
2.4.1 Astrometry	2-27
2.4.2 Photometry	2-28
2.4.3 Anomalies	2-29
Metadata	2-29
Detector Performance	2-29
Bias Stability	2-30

	Negative Saturated Pixels	2-30
2.5	References & Further Information	2-30
	Contributing Authors	2-30
	References	2-30
	For Further Reading	2-31

Chapter 3

NEWFIRM Camera 3-1

3.1	Instrument Overview	3-1
3.1.1	Instrument Capabilities & Design	3-2
	Focal Plane	3-3
3.1.2	Operations	3-7
	Array Operation	3-7
	Observing Sequences	3-9
3.2	Data Products	3-10
3.2.1	Image Formats	3-11
	Raw Data	3-11
	Calibrated Data	3-13
3.2.2	Header Keywords	3-15
3.2.3	Environmental Data	3-18
3.3	Calibration	3-18
3.3.1	Processing Steps	3-19
	Artifact Flagging	3-21
	Dark Correction	3-21
	Linearity Correction	3-21
	Flat-Field Correction	3-22
	Sky Subtraction	3-23
	Astrometric Calibration	3-24
	Photometric Calibration	3-24
	Image Re-projection and Stacking	3-26
3.3.2	Calibration Reference Files	3-26
	Dark	3-27
	Linearity Coefficients	3-27
	Flat-Field	3-27
3.4	Sources of Error	3-28
3.4.1	Astrometry	3-28
3.4.2	Photometry	3-29
3.4.3	Anomalies	3-29
	Metadata	3-29
	Dome Lamp State	3-30
	Saturated Pixels	3-30
	Image Ghosts	3-30
	Background for Narrowband Filters	3-30
3.5	References & Further Information	3-31

	Contributing Authors	3-31
	References	3-32
	For Further Reading	3-32
Glossary	Glossary-1