Contents

1 Introduction 2

2 Participating observatories 3

3 Homogenization of the data 6

4 Latitude meridian observations 10
4.1 Observational data 10

5 Time and latitude meridian observations 12
5.1 Observational data 12

6 Universal time meridian observations 12
6.1 Observational data 12

7 Method of equal altitudes 13
7.1 Observational data 13
7.2 Homogenization 16
7.3 Systematic effects 17
7.3.1 Deformations of the apparent almucantar 17
7.3.2 Colour and magnitude effect 19
7.4 Pre-processing the astrolabe data 20

8 Preparing the data for the adjustment 27
8.1 Plate tectonic motions and mean coordinates of the instruments 27
8.2 Short-periodic tidal variations of the Earth's speed of rotation 29
8.3 Tidal variations of the local vertical 29
8.4 Individual star corrections 29
8.5 Excluding the outliers 39

9 Observation equations 39

10 Normal Equations 41

11 The solution and its practical aspects 44
11.1 Forming the observation equations 44
11.2 Forming the normal equations 45
11.3 Working out the results of the adjustment . 45

12 The results 46

13 Preliminary analysis of celestial pole offsets 49
13.1 Secular part of the celestial pole offsets . . . 51
13.2 Periodic part 51

14 Conclusions 51

15 Acknowledgements 53