Archive of photographic plates in Nikolaev Observatory and some results obtained from them

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Outline

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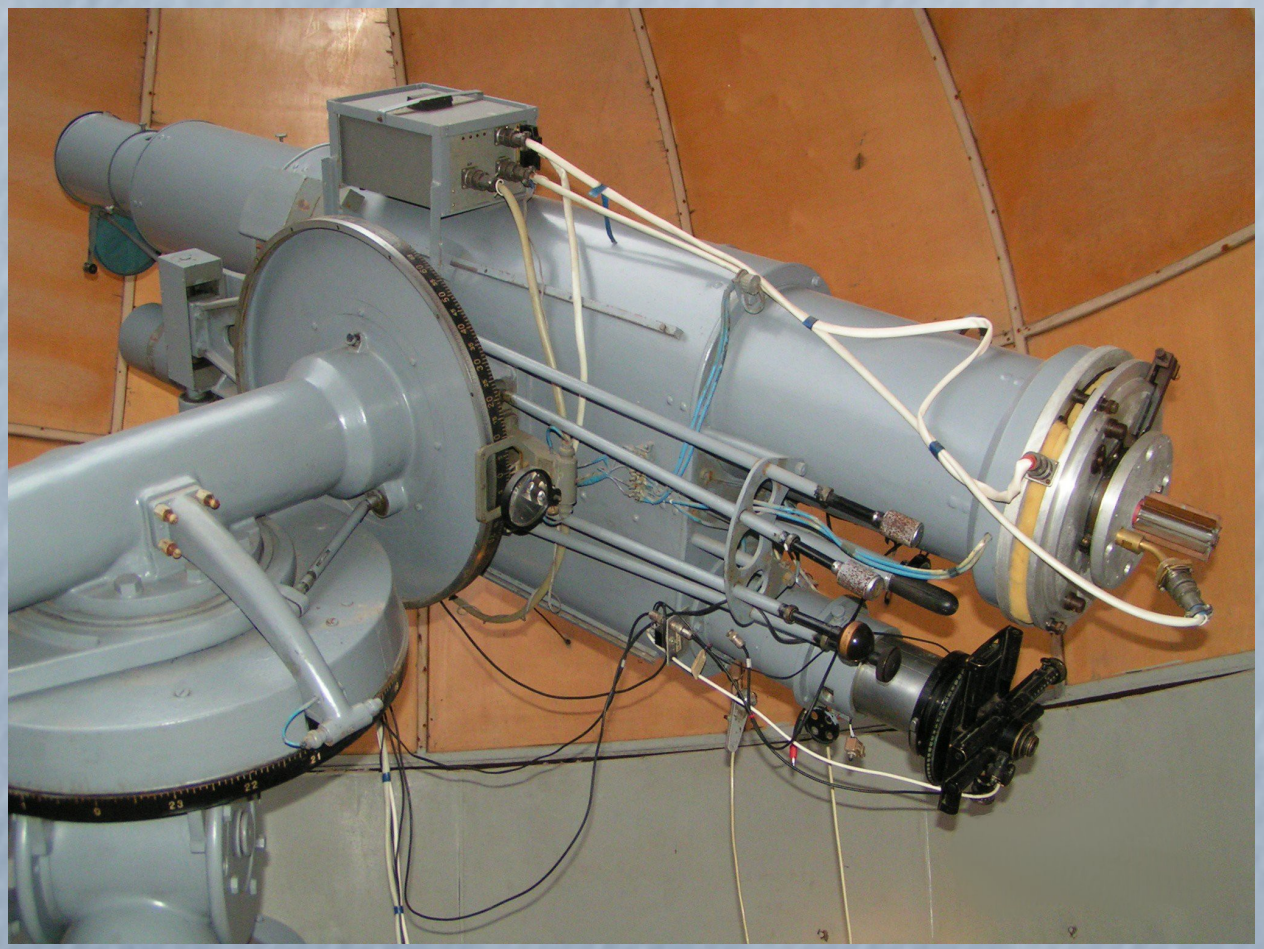
Introduction

- Archive consists of 8.5 thousands of observations made at Zone Astrograph at Pulkovo, Nikolaev in 1928-1998.
- Sizes of plates are from 9×12cm to 24×24cm.
- They represent different astrometric programs.
- Only part of the observations was measured and reduced to equatorial coordinates. Ascorecord-2 was used for measuring, its precision was ~1μm. The number of reference star was varied from 3 to 6.
- "Dependences" of Schlesinger were calculated allowing future easier transformation of coordinates from one catalogue to another.

Telescope used



- Original Zone Astrograph was made by Carl Zeiss Jena for Pulkovo Observatory in 1927
- D=0.12 m, F=2.04 m
- 5°×5°, 100″/ mm
- It was installed in Nikolaev in 1961

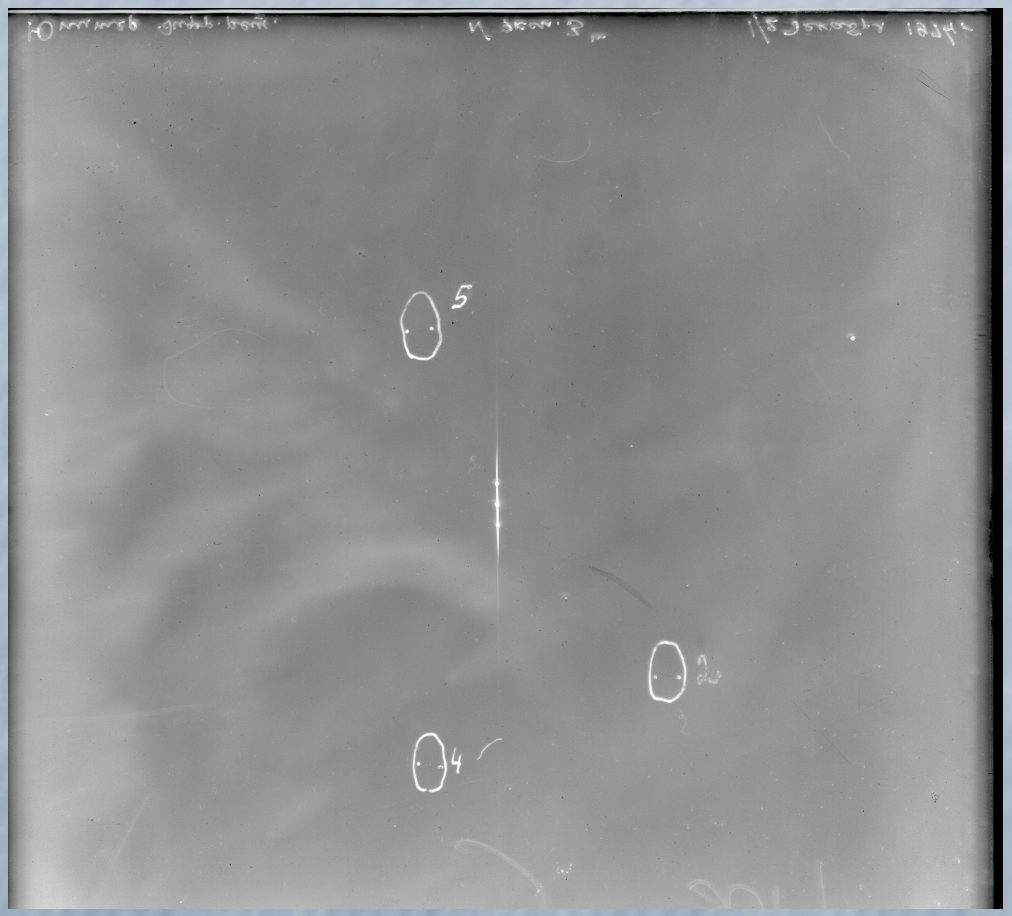
Observations of Planets and Satellites

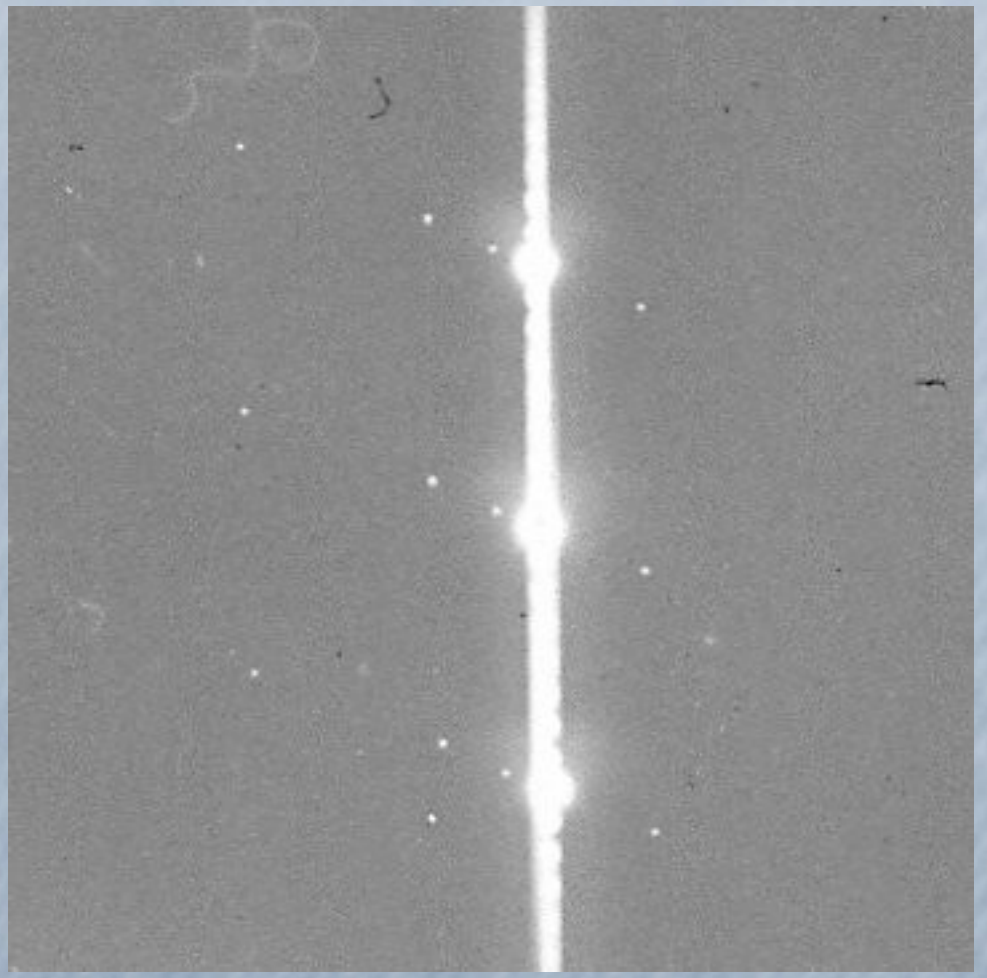
Planets, Satellites	Observational Period	Number of Positions
Venus	1967-80	384
Mars	1961-97	445
Jupiter	1961-97	450
Saturn	1961-97	372
Uranus	1961-97	212
Neptune	1961-97	210
Io	1962-98	304
Europa	1962-98	331
Ganimede	1962-98	340
Callisto	1962-98	339
Tethys	1961-97	105
Dione	1961-97	173
Rhea	1961-97	109
Titan	1961-97	192
Iapetus	1961-97	25

Observations of Galilean satellites in 1962-1998

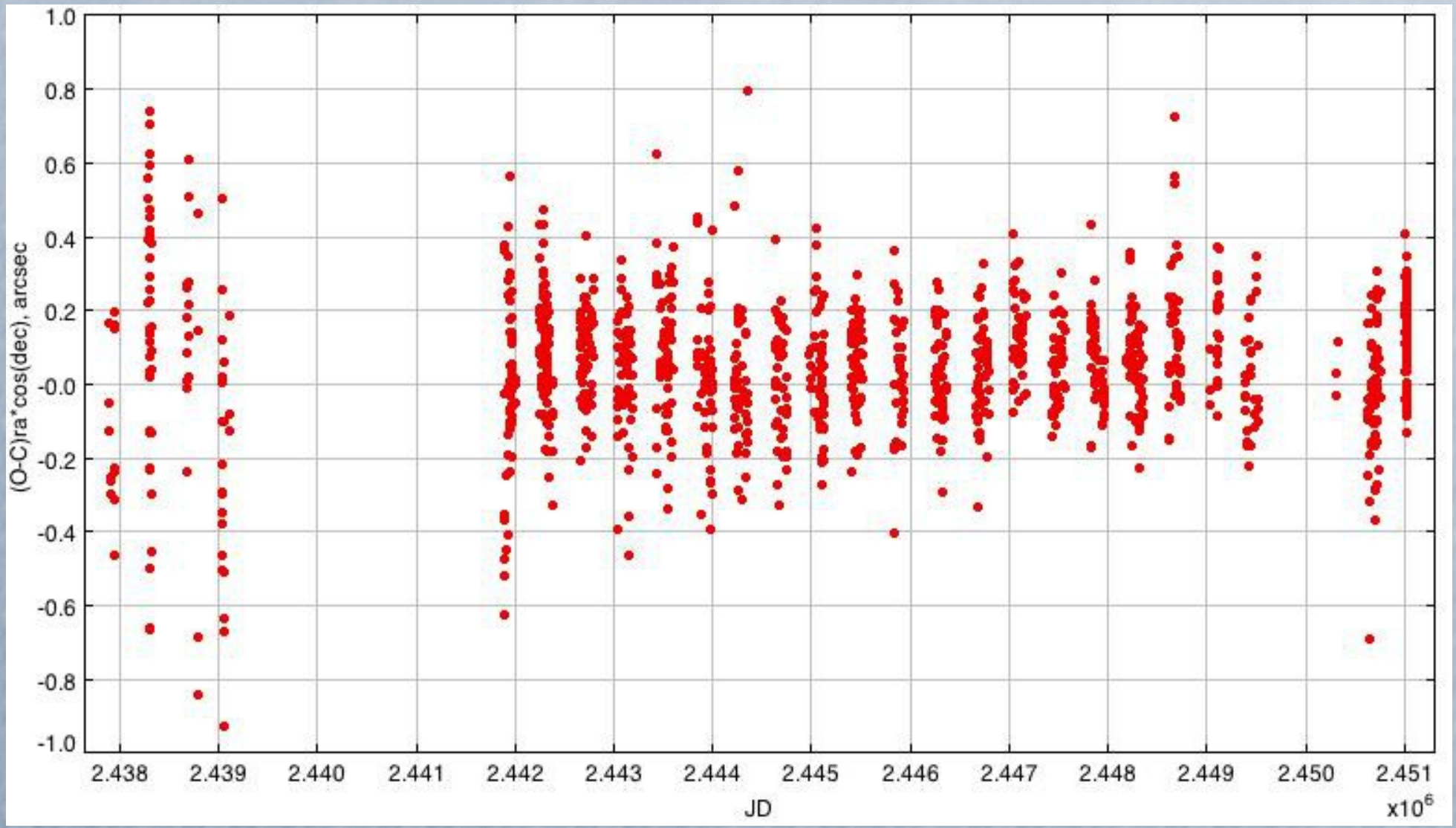
Satellite	(O-C)α,″	σα, ″	(O-C)δ, ″	σδ, ″	Number
Io	0.032±0.010	0.174	−0.079±0.008	0.144	304
Europa	0.046±0.008	0.147	−0.032±0.008	0.153	331
Ganimede	0.068±0.008	0.150	−0.026±0.008	0.156	340
Callisto	0.048±0.007	0.129	−0.015±0.008	0.148	339
Total	0.050±0.008	0.148	−0.036±0.008	0.152	1314

Example of images with Galilean satellites

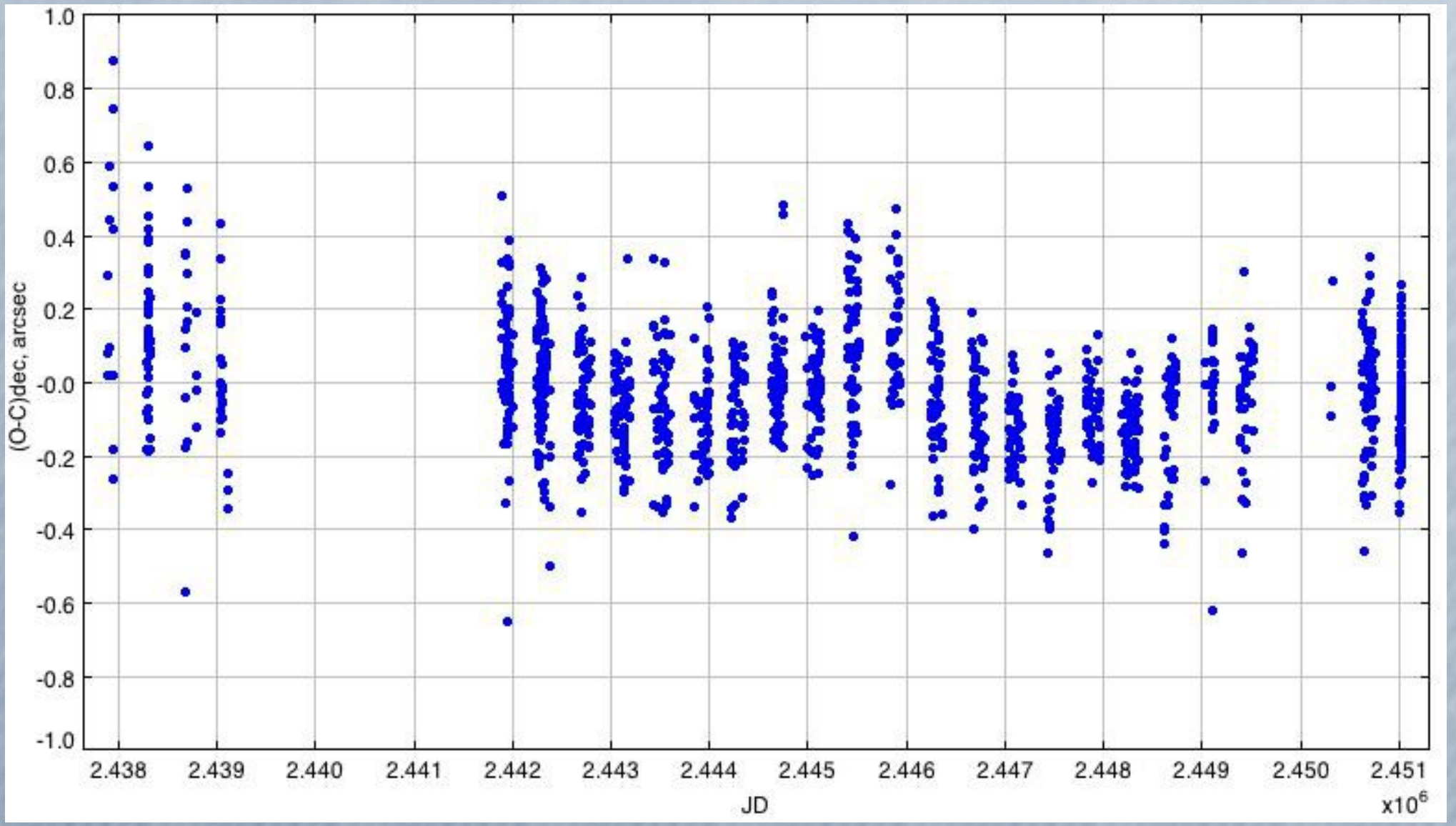




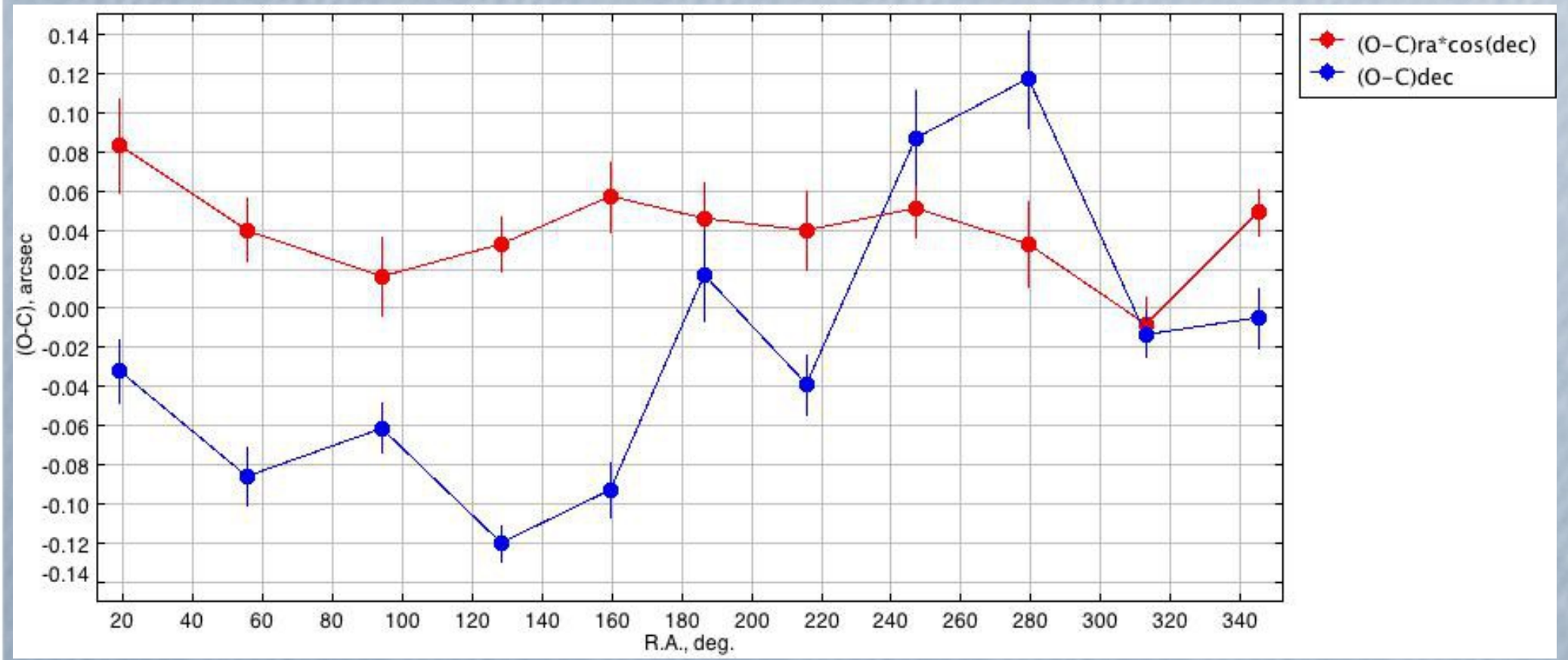
Some Results on Galilean Satellites (I)



Some Results on Galilean Satellites (II)



Some Results on Galilean Satellites (III)



Observations of Selected Asteroids

Asteroids	Observational Period	Number of Positions
(1) Ceres	1961-97	217
(2) Pallas	1961-97	264
(3) Juno	1961-96	245
(4) Vesta	1961-97	241
(5) Astraea	1983	4
(6) Hebe	1961-97	226
(7) Iris	1961-97	197
(11) Parthenope	1961-97	196
(15) Eunomia	1987-91	12
(18) Melpomene	1961-97	212
(25) Phocaea	1976-91	34
(39) Laetitia	1961-93	237
(40) Harmonia	1961-94	203
(148) Gallia	1977-78	8
(185) Eunike	1972-73	6
(389) Industria	1991	4
(433) Eros	1975	11
(532) Herculina	1975-91	68
(704) Interamnia	1974-90	65

Stellar Catalogues

The North Pole zone (+70º÷+90º declination) was observed twice in 1928-1930 (200 plates) and 1973 (250 plates).

Zodiacal zone within ±10º of the ecliptic was observed with twice overlapping. It contains 196 plates. The mean epoch is 1979.

Equatorial zone within ±4º of the celestial equator was observed with four-time overlapping. It contains 485 plates. The mean epoch is 1992.

Selected fields all over the sphere were observed. The stars from the list of A.Mikhailov were observed on 104 plates. The mean epoch is 1978. ROAS observational program (131 fields on 217 plates). The mean epoch is 1980.

Present State

- Nikolaev Observatory supposes to finish making “preview” of low resolution for all plates of the archive.
- Information will be opened to public through the website of the observatory http://www.nao.nikolaev.ua and the Ukrainian Virtual Observatory, http://ukr-vo.org.
- Few images are already available, http://212.111.210.10/UkrVO/DB/NAO//vo3.php

Conclusions

- Any photographic archive becomes older. The conditions for its preservation are demanding. Supporting information becomes less accessible, if it was not completely filled in, as the people pass.
- The archive of plates in Nikolaev has shown already its usefulness, but has not been even completely measured and reduced.