Astrometrical Observations of the Near-Earth Asteroid 308635 (2005 YU55) in Nikolaev

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Outline

- Summary on the NEA
- Observational conditions in 2011
- Telescope used for observations
- Statistics of residuals
- Histogram of the residuals in R.A. and Dec.
- Scatter of residuals for two nights of observations
- Conclusions

Summary on the NEA

- Appollo group (PHA), discovered by Spacewatch on 28-12-2005 at Kitt Peak (691)
- Earth MOID= 0.000454 a.u.
- Diameter = 0.4 km
- Data arc span 2170 days=5.94 years
- Used 2555 observ. + 9 delay observ. + 10 Doppler observ.
- Fit RMS=0.3412”,
- add. see http://ssd.jpl.nasa.gov/sbdb.cgi

Observational Conditions in 2011

Close approach of 0.00218 a.u happened on 08-11-2011:

- Minimal visible magnitude was 11.5 mag
- Maximal visible speed was 8.6 deg/hour
- Solar elongation 82...168 degrees

Telescope used for observations

Mobitel telescope of Nikolaev Observatory:

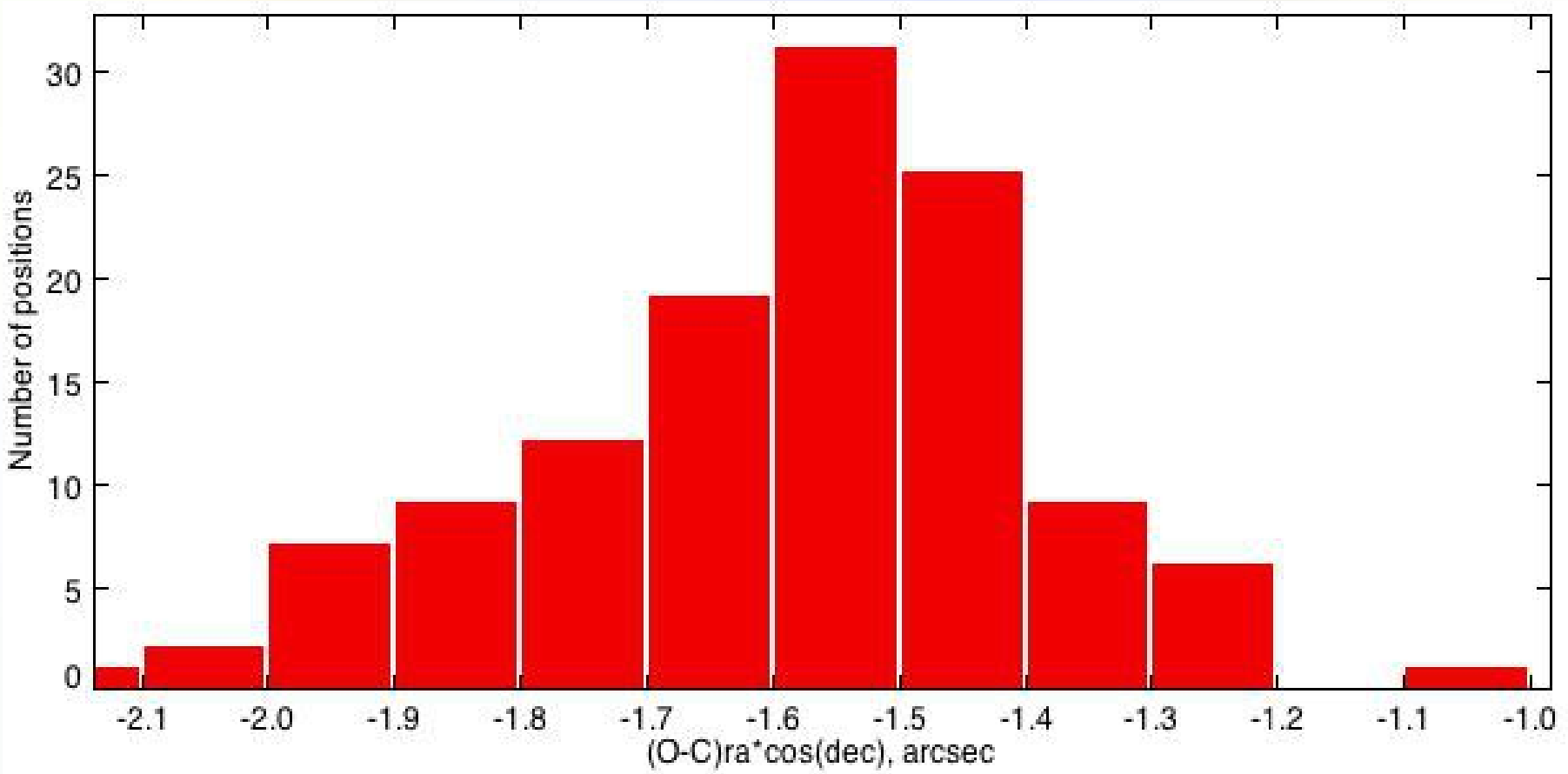
- D = 0.5 m
- F = 3.0 m
- FOV = 42' x 42'
- Scale = 0.83”/pix
- TDI mode

Statistics of Residuals

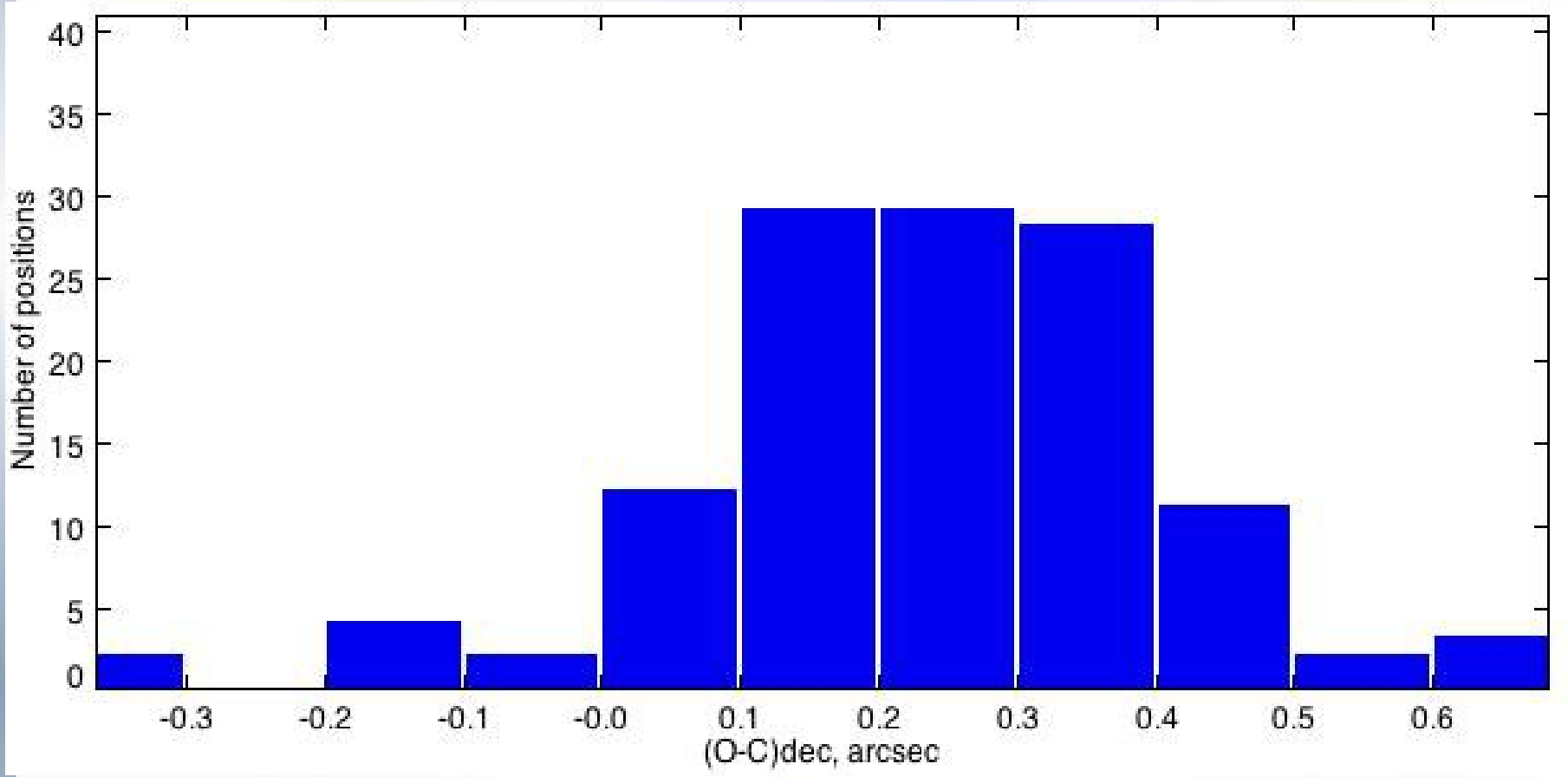
Date	Num	dRA/dt x cos(dec), arcsec	(O-C)ra x cos(dec), arcsec	RMSra, arcsec	dDec/dt, arcsec	(O-C)dec, arcsec	RMSdec, arcsec
09-11-2011	120	2382.02	-1.585	0.195	251.62	0.245	0.152
17-11-2011	20	11.28	-0.222	0.036	3.28	0.087	0.063
18-11-2011*	20	26.06	-0.178	0.571	10.18	0.210	0.301

* The positions were obtained by different method and group (A.Shulga et al.) and published in MPS 377162 & MPS 418370.

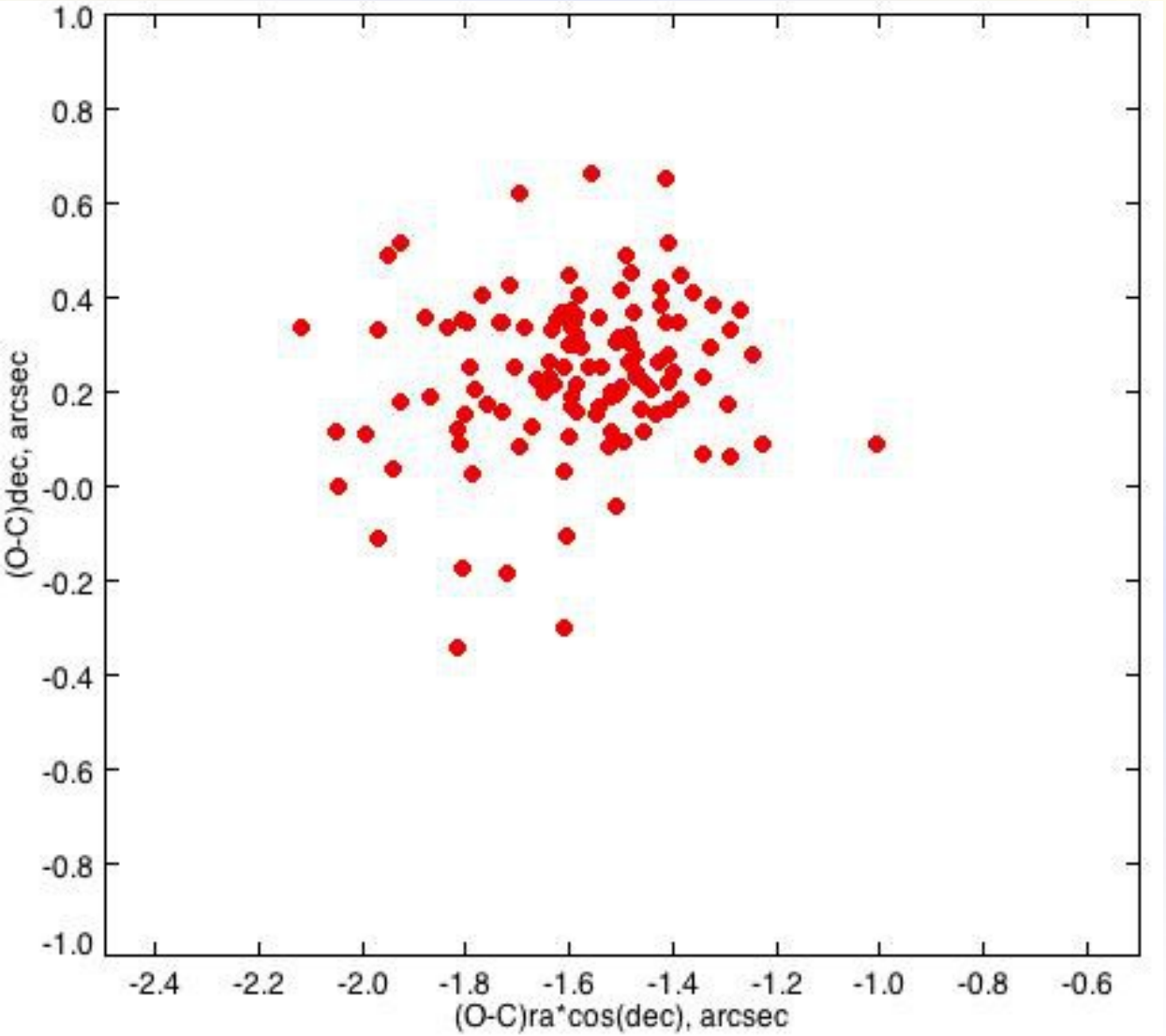
Histogram of the residuals in R.A. on 09-11-2011



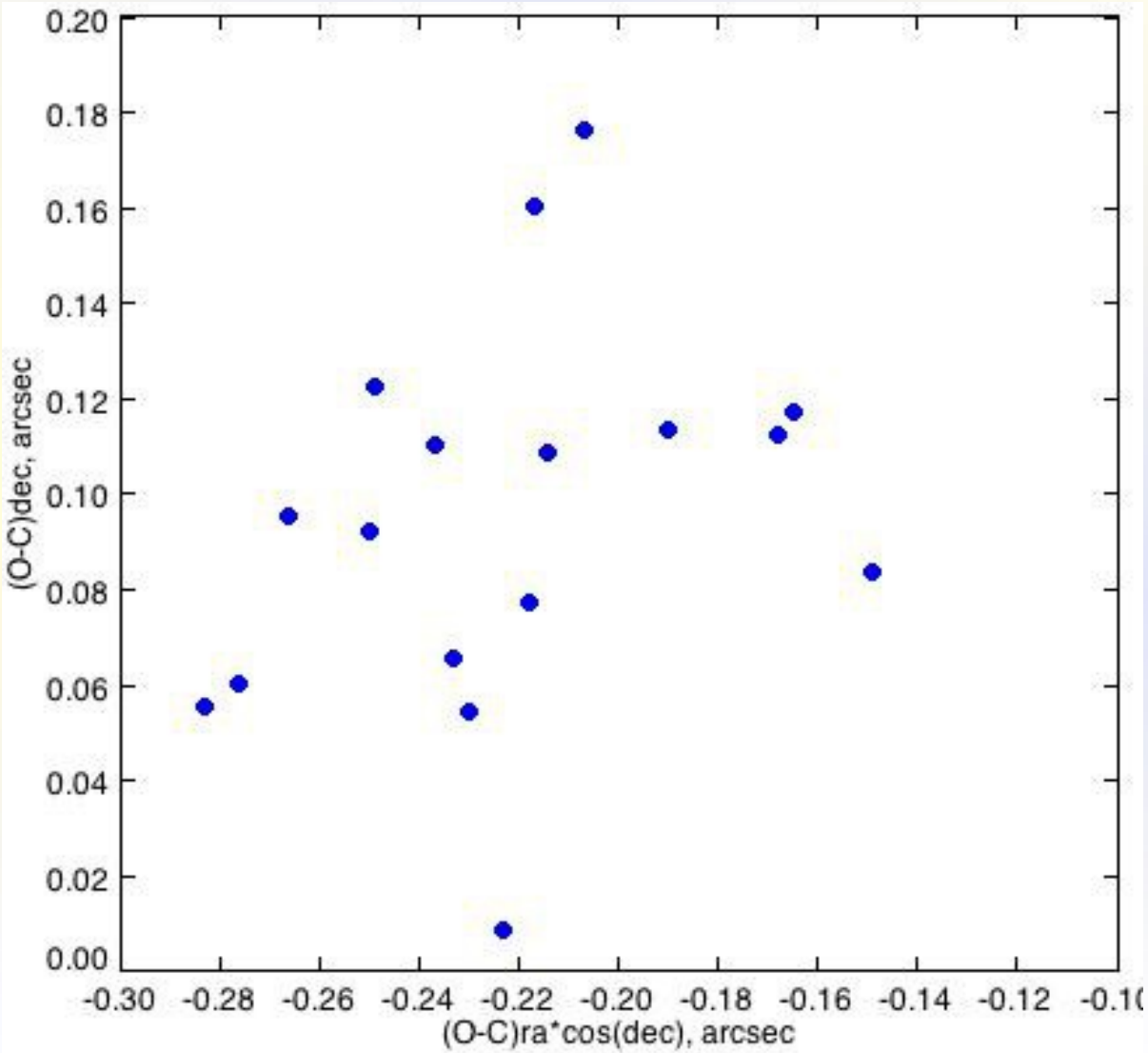
Histogram of the residuals in Dec. on 09-11-2011



Scatter of residuals on 09-11-2011



Scatter of residuals on 17-11-2011



Conclusions

- The achieved weighted precision of 140 astrometrical observations made at the Mobitel telescope for the fast NEA in 2011 apparition was 0.18” in R.A. and 0.14” in Dec.
- These observations are useful for improving the current orbit of the NEA, as the found mean values of (O-C) are significantly different from zero.