New astrometry for NEOs in the frame of EURONEAR

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Abstract

The major objective of Euronear is the high precision astrometry of Near Earth Asteroids (NEAs) in a coordinated network. It envisions to create synergies between planetologists for follow-up, precovery, and recovery of NEAs and Potential Hazardous Asteroids (PHAs). Between 2006 and 2007 the activity was conducted toward the identification of 1 metre class telescopes available to be included and operated by the Euronear members, and to promote this initiative inside the scientific community, alongside to several dedicated nights of observations. For this period, 169 astrometric positions were accepted by the MPC and included in the NEODyS database. Part of these observations were used to secure the orbit of the object 2007 JX2. These results, together with future plans will be presented.

The EuroNear project envisions to establish a coordinated network which will follow-up and recover NEAs/PHAs using 1m class telescopes (dedicated and non-dedicated) located in Europe and elsewhere.

Science:

- **Recover new discovered bodies;**
- **Secure and improve their orbits;**
- **Predict future close encounters and possible collisions with Earth;**
- **Determine physical parameters (rotation periods, colors, taxonomy, etc);**

New visitor runs EURONEAR

Observatoire de Haute Provence -France

- 5-11 May 2007, Haute Provence, France: O. Vaduvescu and A. Nedelcu observed 16 NEAs/PHAs for EURONEAR using the 1.2m telescope; (data reduction: M. Birlan, A. Sonka, A. Nedelcu)

  Telescope: T120 (1.20 m of diameter),
  FOV: 11.7'x11.7'
  CCD camera: 1024 x 1024
  Data reduction catalogues: USNO-B1 and UCAC2
  153 astrometric positions were computed and reported to NEODys and MPC

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- 7, 13 November 2006, Celestron 0.23 m, FOV 21'x21', CCD camera TC237 (640x500 pixels), Data reduction catalogue: USNO-B1, (data reduction:A. Sonka) 2 asteroids and 6 positions were reported

TENTATIVE RUN ESO 1m

- 11-14 Aug 2007, La Silla, Chile: O. Vaduvescu, F. Colas, and C. P. Soto inspected the ESO 1m telescope allocated by ESO for EURONEAR using a visiting camera ST-10. Among other data, two NEAs were observed: 2007 FV42 and 2007 PA8 (a Virtual Impactor).

  Data was reduced and accepted by MPC/NEODyS. (data reduction: M. Birlan). The astrometric calibration is in work.

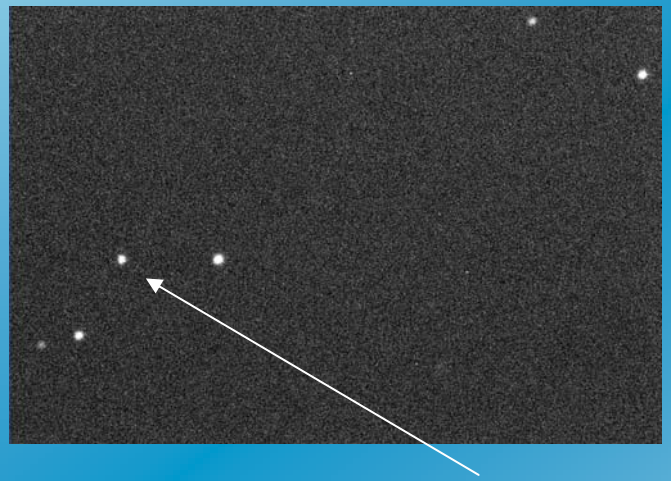
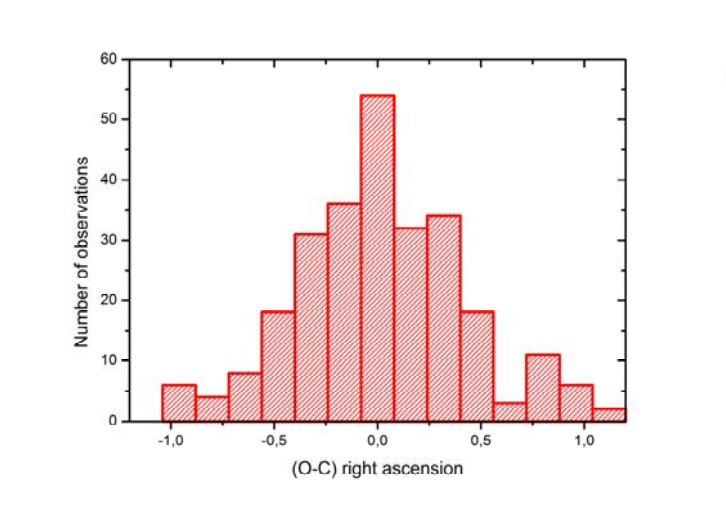
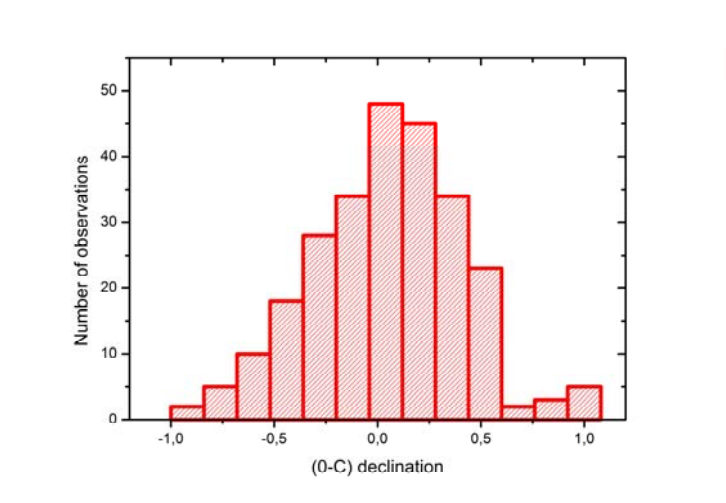


Image of the asteroid 2007 FV42 obtained in August 13, 2007

Telescope field: 2.4'x3.5'
Detector: SBIG-10 (2184x1472 pixels)
Data reduction catalog: USNO-B1





Statistics of 280 astrometric observations obtained in 2006 and 2007, and their (Observed minus Calculated) differences (in arcseconds) in right ascension and declination, respectively. All positions have residuals less than one arcsecond and a Gaussian distribution .

LIST OF ASTEROIDS OBSERVED IN 2007

Asteroid	Type	Obs	Obs-Dis	V	μ	Exp	Pos
2007 FK1	NEA	6/7	50 days	16.7	5.5	60	12
2007 FV42	NEA des	6/7	44 days	17.3	1.0	180	10
2007 FL1	NEA des	6/7	47 days	17.9	3.5	90	10
2007 DZ40	NEA	7/8	74 days	18.0	3.0	90	5
2006 KE89	NEA des	7/8	1 year	18.6	1.7	90	10
2006 GB	PHA des	7/8	1 year	19.2	2.2	120	10
2007 DF8	NEA des	8/9	75 days	19.6	1.4	180	10
2007 DT103	PHA desA	8/9	73 days	20.0	0.3	500	2
2007 HX4	NEA des	8/9	18 days	19.8	2.7	180	7
2007 FE1	NEA des	9/10	53 days	19.8	1.5	180	11
2007 JX2*	NEA new	9/10	1 day	19.0	4.4	40	11
2007 HX4	NEA des	9/10	19 days	19.9	2.7	120	9
2006 HR29	NEA	9/10	1 year	17.9	3.0	60	8
2007 HX82	NEA des	9/10	13 days	19.6	1.4	180	11
2006 VY13	NEA des	9/10	1 year	19.7	0.6	300	4
2007 CQ5	NEA	9/10	92 days	19.2	1.2	120	5
2007 FV42	NEA	12/13	140 days	16.5	0.8	120	12
2007 PA8	NEA des	12/13	9 days	19.2	0.6	120	4

Legend: Type: Asteroid type (as quoted by MPC at obs. date): des=desirable, new=urgent, secure the orbit, desA=desirable and Arecibo target; Obs = Observing night (May and August 2007); Obs-Dis = time from discovery; V=magnitude; μ =proper motion ("/minute); Exp = Exposure time (sec); Pos=Nr of positions included in NEODyS.

FUTURE PLANS

- Fall 2007, Cerro Armazones, Chile: O. Vaduvescu plans to observe for EURONEAR using the 0.84m telescope;
- 10-13 Mar 2008, La Silla, Chile: O. Vaduvescu and M. Birlan will attend the first EURONEAR observing run on a 2m class telescope, namely the ESO/MPG 2.2m;
- Several proposals have been submitted for telescopes in France (OHP, Pic du Midi), Bulgaria (Rozhen), and Chile (La Silla, Cerro Armazones)
- Refine the run schedule
- Improve the EURONEAR website

Comments