Strategies for Secure and Recovery Near-Earth Objects

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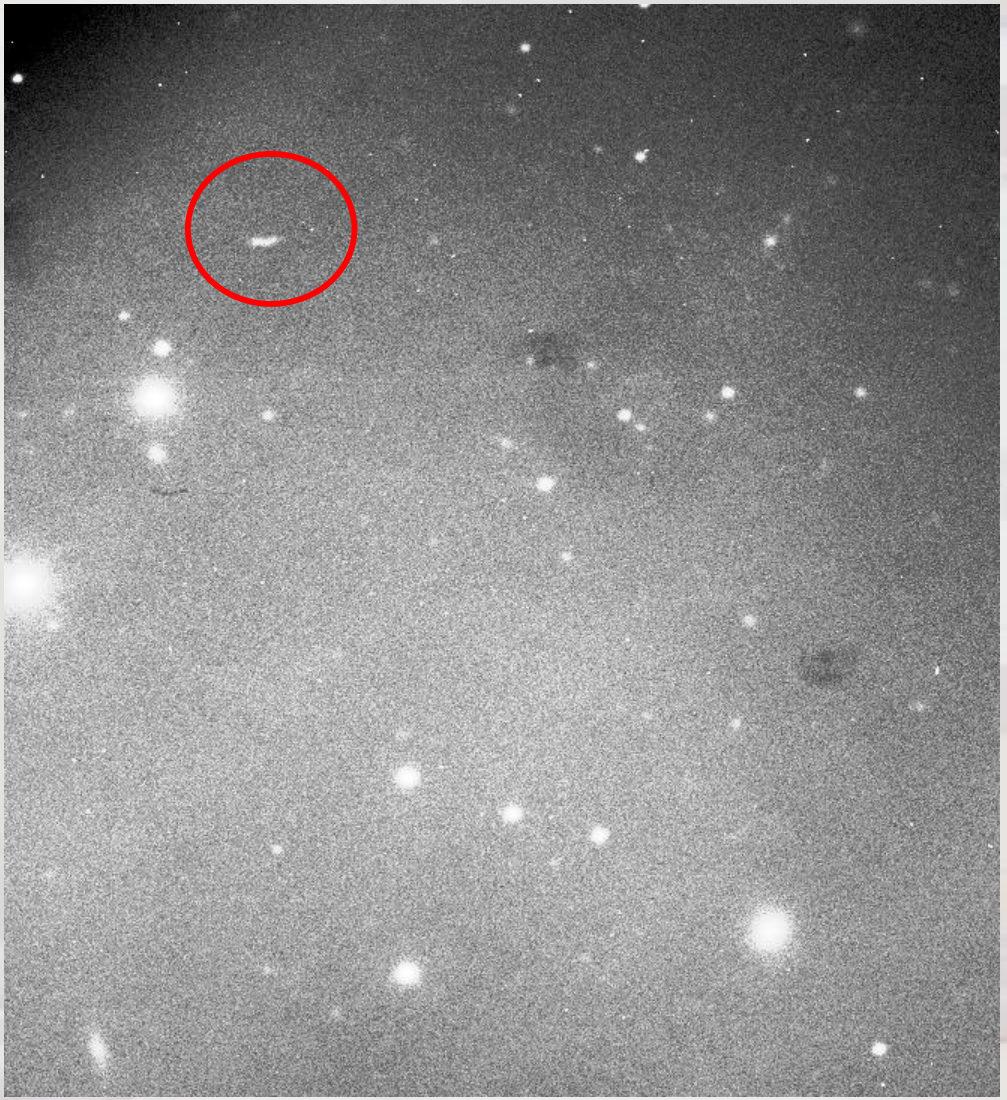
NEO recovery, identifications, limitations

Observing runs: usually on-site

Locations:
- Pic du Midi Observatory, France
- Observatoire de Haute Provence, France
- Astronomical Obs, Bucharest, Romania

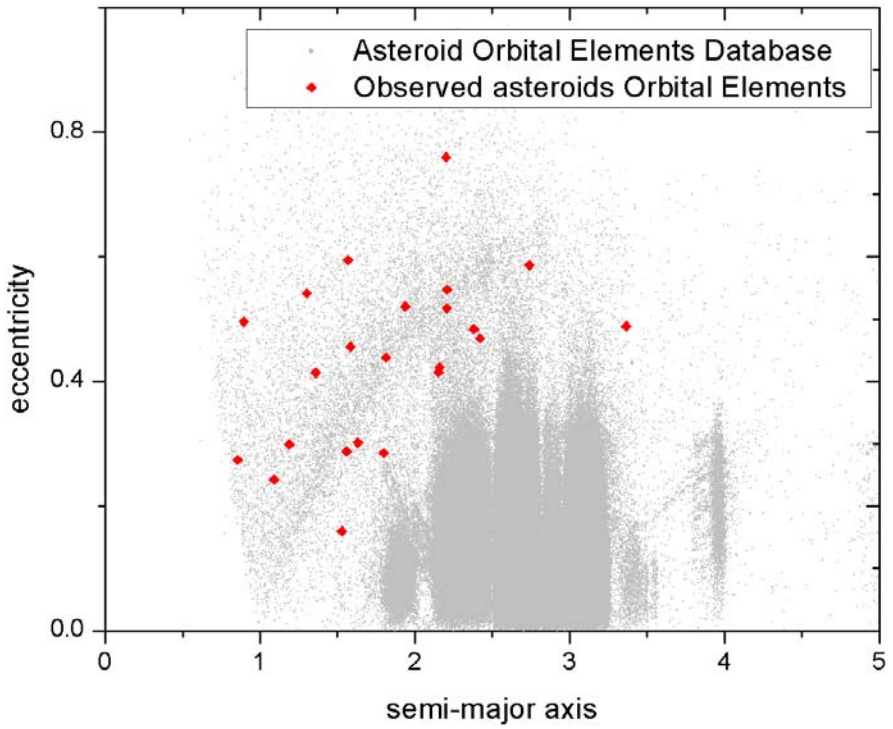


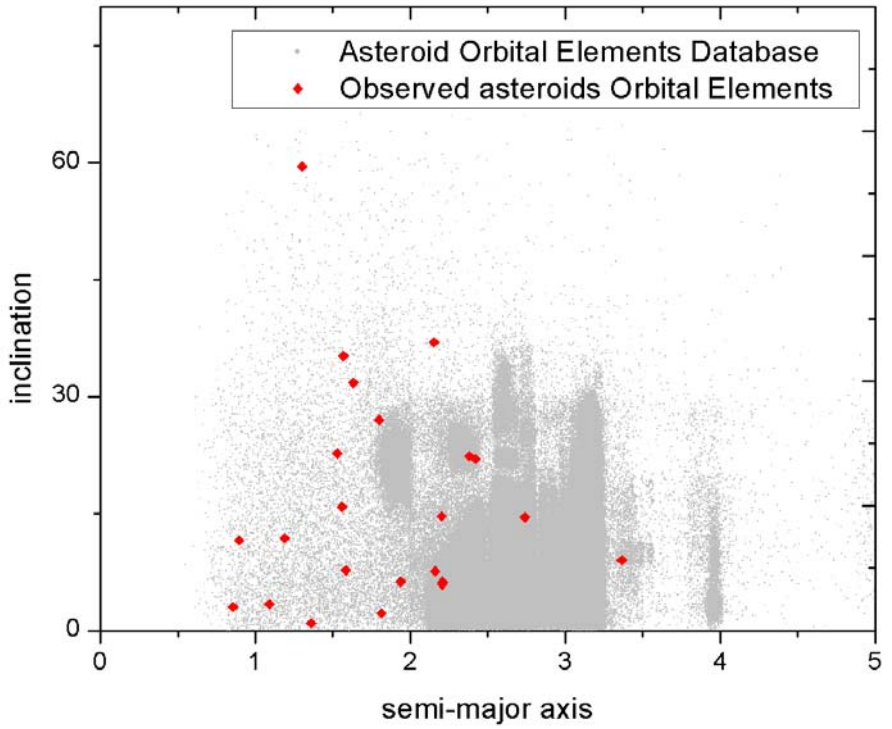
Stack of 6 images of a potential NEO P10fzfY (MPC-Confirmation Page)

Table 1: Non-exhaustive list of NEAs observed between 2010 and 2015 in several campaigns. Provisional designations, semi-major axis, eccentricity and inclination of osculating elements are given for the epoch 2014-12-09.0. NEA dynamical type, as well as the reference of Minor Planet Electronic Circular (M.P.E.C.) providing our observations are also presented. The object 2014 UK192 is classified as Main Belt Asteroid.

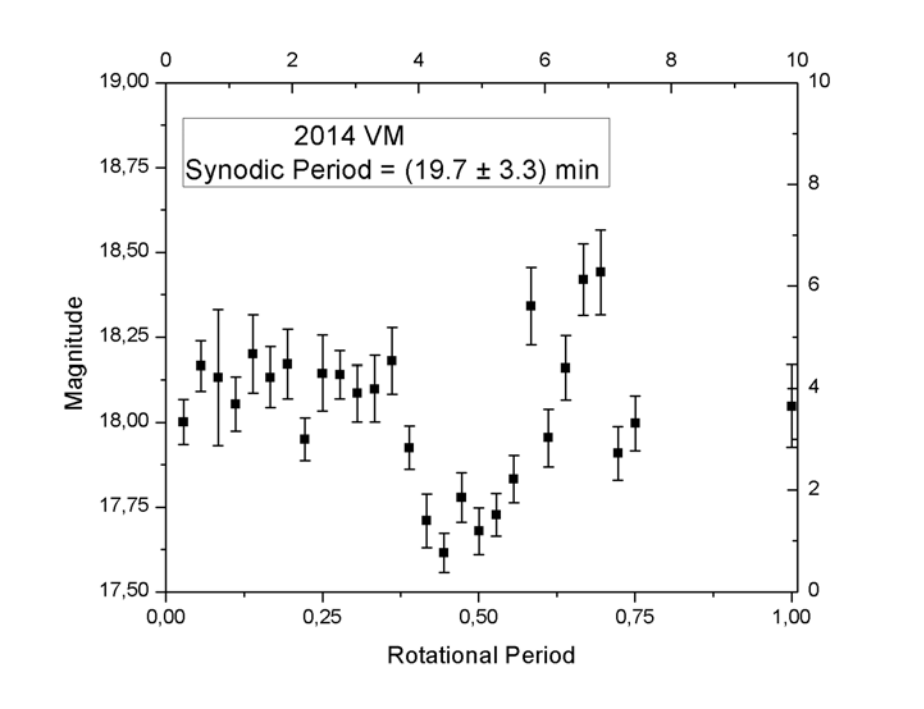
NEA	a (a.u.)	e	i(°)	NEA type	M.P.E.C
2014 VM	2.1535124	0.4148709	36.97803	Amor	Okumura et al. (2014)
2014 US192	2.2027794	0.7595504	14.65026	Apollo	Ticha et al. (2014)
2014 VA	1.8139387	0.4380610	2.23161	Amor	Sonka et al. (2014)
2014 UF192	1.5825267	0.4557009	7.73621	Apollo	Birlan et al. (2014)
2014 UK192	3.3649292	0.4885547	9.05532		Mastaler et al. (2014)
2011 WD39	1.3019350	0.5412677	59.49088	Apollo	Buzzi et al. (2011d)
2011 WF32	2.7394031	0.5865897	14.53435	Apollo	Buzzi et al. (2011e)
2011 WE32	2.3812352	0.4839101	22.34829	Amor	Buzzi et al. (2011g)
2011 WK5	2.2078064	0.5170668	5.90199	Amor	Birlan et al. (2011e)
2011 WW4	2.1614362	0.4226000	7.62210	Amor	Birlan et al. (2011d)
2011 WV4	1.1893345	0.2992218	11.84412	Apollo	Buzzi et al. (2011a)
2011 WU4	1.9386622	0.5203603	6.27510	Apollo	Buzzi et al. (2011b)
2011 WP4	1.3594178	0.4141706	0.94579	Apollo	McMillan et al. (2011)
2011 WV2	1.5288187	0.1597595	22.67803	Amor	Buzzi et al. (2011c)
2011 WM2	1.5594827	0.2878923	15.87041	Amor	Buzzi et al. (2011f)
2011 EX4	0.8559303	0.2738107	3.02597	Aten	Apitzsch et al. (2011)
2011 ET4	1.6318466	0.3017713	31.76056	Amor	Lehmann et al. (2011)
2011 ES4	1.0908755	0.2427512	3.37713	Apollo	Birlan et al. (2011b)
2000 EB14	0.8957034	0.4956657	11.57154	Aten	Birlan et al. (2011a)
2007 ES	1.5697780	0.5948026	35.21093	Apollo	Birlan et al. (2011c)
2010 RF181	2.2082995	0.5471225	6.24883	Amor	Birlan et al. (2010b)
2010 WJ	1.7980100	0.2853231	27.02098	Amor	Birlan et al. (2010a)
2010 WH	2.4217895	0.4689646	21.98781	Amor	Birlan et al. (2010c)

NEO confirmation panorama

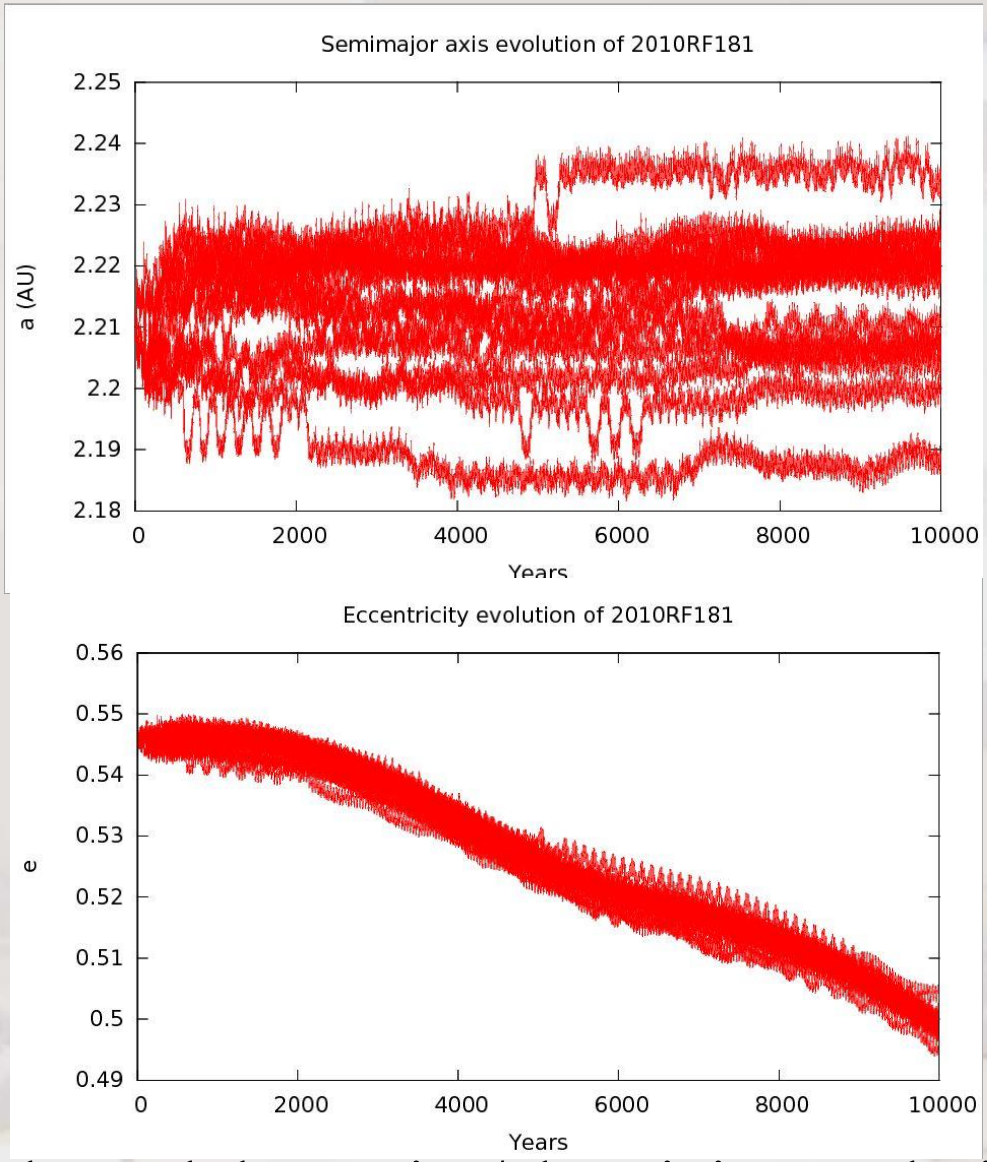




Results



Spin – fast rotators (2014 VM)



Backward dynamics/chaoticity evolution (20 clones of PHA 2010 RF181)

Successful 7days run (D<1.2m telescopes)

- Optimum for recovery & secure orbits: 10-20 images of object
- Insufficient for photometry (except fast rotators asteroids)
- Good balance between astrometry & photometry
- Observing one object for about 40-50 min allows reliable information for Psyn < 2÷2.5 hr