A photometric search for activity among asteroids and Centaurs

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We present the first results of a long-term observational campaign focused on the detection of activity in selected asteroids and centaurs. Our observational targets are near-Earth asteroids in cometary orbits (cf. [2]), the so called "main-belt comets" or "active asteroids" (well-known objects as well as potential candidates), and bright centaurs with good orbits, all close to their perihelion passages. In those objects with a former detection of activity, our aim is to contribute to a better physical knowledge of them, and determine, for instance, if the observed activity is transient or permanent.

To achieve our goals, we analyzed CCD-filtered images of each observable target acquired with the 2.15-m telescope "Jorge Sahade" at CASLEO (San Juan, Argentina), during two runs of three consecutive nights each (during August 2013 and January 2014, respectively). Our study will be completed by future runs with the same instrumentation already assigned to our campaign.

As preliminary results, we observed activity in the main-belt comets P/2013 P5 (PANSTARRS) and 133P/(7968) Elst-Pizarro. We also observed the main-belt comet (596) Scheila, which showed an unequivocally stellar appearance. We observed the main-belt comet candidate (3646) Aduatiques (cf. [1]), and noticed in this object a curious feature whose connection to some kind of activity is not well determined yet. We also observed the near-Earth asteroid in cometary orbit 2006 XL_5 (cf. [3]), and the centaurs (281371) 2008 FC_{76}, (332685) 2009 HH_{36}), (382004) 2010 RM_{64}, 2010 XZ_{78}, and 2011 UR_{402}. We have not detected activity in these objects, but an improved analysis is still in progress.

References: [1] A photometric search for active Main Belt asteroids. 2014. Cikota, S.; Ortiz, J. L.; Cikota, A.; Morales, N.; Tancredi, G. 2014. Astron. Astrophys., 562, A94, 8 pp. [2] Assesing the physical nature of near-Earth asteroids through their dynamical histories. Fernández; J.A., Sosa, A.; Gallardo, T.; Gutiérrez, J.N. Submitted to Icarus. [3] A criterion to classify asteroids and comets based on the orbital parameters. 2014. Tancredi, G. Icarus 234C, pp. 66–80.