

Spectral properties of the extreme solar system objects 2012 DR30 and 2013 AZ60

Gy. M. Szabó (1,2), Cs. Kiss (2), R. Duffard (3), N. Pinilla-Alonso (3,4), J. Licandro (5,6)

(1) Gothard Astrophysical Observatory of Loránd Eötvös University, Szombathely, Hungary (2) MTA CSFK Konkoly Observatory, Budapest, Hungary, (3) Instituto de Astrofísica de Andalucía (IAA-CSIC) Glorieta de la Astronomía, s/n 18008 Granada, Spain (4) Earth and Planetary Sciences Department, University of Tennessee, USA (5) (1) Instituto de Astrofísica de Canarias (IAC), C/vía Láctea s/n, 38205, La Laguna, Tenerife, Spain (6) Departamento de Astrofísica, Universidad de La Laguna (ULL), 38205, La Laguna Tenerife, Spain

Abstract

2012 DR30 and 2013 AZ60 represent two examples of TNOs with very large aphelion distances (2405 and 1951 AU, respectively), thus standing for the currently best candidates of possible scattered-in Oort-cloud objects. Though they possibly shared a similar dynamical scenario, the two bodies exhibit surprisingly diverging prediction for orbital evolution and also quite different surface properties (Kiss et al. 2013, Kiss et al. 2014).

Here we compare these optical and infrared photometry and spectra of the two bodies. Both show a generally flat spectrum, but with significantly differing slope. We find clear signs of water ice on 2013 DR30 particularly, which is an exciting diagnostic of a possible water reservoir at very large perihelion distances, and on the other hand, suggests a close link between the giant cometary nuclei of the Oort Cloud (for that Hale-Bopp is the only known example in our Solar System) and these exotic TNOs.

Acknowledgements

Based on observations made with the Gran Telescopio Canarias (GTC), instaled in the Spanish Observatorio del Roque de los Muchachos of the Instituto de Astrofísica de Canarias, in the island of La Palma. This project was supported by the Hungarian OTKA grants K83790, K104607, the PECS-98073 program of the European Space Agency (ESA) and the Hungarian Space Office, the Lendület 2009/2012 Young Researchers' Programs and the Bolyai Research Fellowship of the Hungarian Academy of Sciences and by the city of Szombathely under Agreement No. S-11-1027. RD acknowledge the support of MINECO for his Ramón y Cajal Contract.

References

References

[1] Kiss, Cs., Szabó, Gy. M., Horner, J., Conn, B. C., Müller, T. G., Vilenius, E., Sárneczky, K., Kiss, L. L., Bannister, M., Bayliss, D., Pál, A., Góbi, S., Verebélyi, E., Lellouch, E., Santos-Sanz, P., Ortiz, J. L., Duffard, R., Morales, N.: A portrait of the extreme solar system object 2012 DR30, *Astronomy & Astrophysics*, Volume 555, id.A3, 13 pp., 2013

[2] Kiss, Cs. et al., in prep., 2014