

Taurus Hill Observatory Scientific Observations for Pulkova Observatory during the 2016-2017 Season

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Abstract

Taurus Hill Observatory (THO) [1], observatory code A95, is an amateur observatory located in Varkaus, Finland. The observatory is maintained by the local astronomical association Warkauden Kassiopeia. THO research team has observed and measured various stellar objects and phenomena. Observatory has mainly focused on exoplanet light curve measurements, observing the gamma rays burst, supernova discoveries and monitoring [2]. We also do long term monitoring projects [3].

1. Exoplanet observations during the season 2016-2017 for Pulkova Observatory

During the winter 2016 - 2017 Taurus Hill Observatory [1] has been actively involved with the Pulkova Observatory, Russia, in a project to look for new exoplanets. During the winter, the brightness variations and the abnormalities of few selected stars have been closely monitored at Taurus Hill Observatory. The aim of the observation campaign is to find out about the orbiting times of potential exoplanets around their central star and the magnitude of brightness change in the central star caused by them.

2. Variable star discoveries during the exoplanet campaign

In these exoplanet observations made in THO four completely new variable stars, some of which appear to be WUMa-type variables and one HADS-type variable, have been unexpectedly discovered among the comparison stars used to determine the change in brightness of the exoplanets. For determining the type of the one remaining variable star requires more additional observations, which will be made during

the next observation season 2017-2018. These variable stars were detected when various unexpected changes occurred in the mutual brightness of the observed exoplanet candidate or the reference stars that were observed.

3. Asteroid 3169 Ostro observations

In addition, during the spring 2017, asteroid 3169 Ostro has been observed for the Pulkova Observatory. Ostro has a regular period in the light curve and this regularity of the period may indicate that the asteroid is very concise or interrelated double-asteroid.

Summary and Conclusions

The discoveries regarding the four completely new variable stars needs more observations during the next observation season, especially the fourth one that has not been yet categorized and identified. Also the asteroid 3169 Ostro requires more observations for determining the nature of the asteroid. Exoplanet observations campaign for Pulkova Observatory continues on the observation season 2017-2018.

Acknowledgements

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References

- [1] Taurus Hill Observatory website, <http://www.taurushill.net>
- [2] A low-energy core-collapse supernova without a hydrogen envelope; S. Valenti, A. Pastorello, E. Cappellaro, S. Benetti, P. A. Mazzali, J. Manteca, S. Taubenberger, N. Elias-Rosa, R. Ferrando, A. Harutyunyan, V.-P. Hentunen, M. Nissinen, E. Pian, M. Turatto, L. Zampieri and S. J.

Smartt; Nature 459, 674-677 (4 June 2009); Nature Publishing Group; 2009.

[3] A massive binary black-hole system in OJ 287 and a test of general relativity; M. J. Valtonen, H. J. Lehto, K. Nilsson, J. Heidt, L. O. Takalo, A. Sillanpää, C. Villforth, M. Kidger, G. Poyner, T. Pursimo, S. Zola, J.-H. Wu, X. Zhou, K. Sadakane, M. Drozd, D. Koziel, D. Marchev, W. Ogloza, C. Porowski, M. Siwak, G. Stachowski, M. Winiarski, V.-P. Hentunen, M. Nissinen, A. Liakos & S. Dogru; Nature - Volume 452 Number 7189 pp781-912; Nature Publishing Group; 2008