Astronomische Nachrichten 2018 vol.339 N5, pages 375-381

Photometric calibration of a wide-field sky survey data from Mini-MegaTORTORA

Orekhova N., Perkov A., Sasyuk V.

Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

© 2018 WILEY-VCH Verlag GmbH & Co. KGaA, Weinheim Mini-MegaTORTORA is a nine-channel wide-field camera that continuously monitors the sky looking for rapid optical transients since mid-2014. It is also performing a regular sky survey, and has already acquired nearly half a million images covering every point of Northern Sky hundreds to thousands of times. Photometric analysis of these data may provide a huge amount of information useful for the detection and characterization of different types of variable objects. Here we present a brief description of our activities related to the acquisition, processing, and calibration of these data, as well as examples of uncataloged variable stars of various types detected during the analysis.

http://dx.doi.org/10.1002/asna.201813509

Keywords

methods: Data analysis, stars: Variables: General, surveys, techniques: Photometric

References

[1] Barbary, K. 2016, J. Open Source Software, 1(6), 58. https://doi.org/10.21105/joss.00058

[2] Bertin, E., & Arnouts, S. 1996, June, A&A, 117, 393

[3] Beskin, G., Bondar, S., Karpov, S., et al. 2010, Adv. Astron., 2010, 1. https://doi.org/10.1155/2010/171569

[4] Beskin, G., Karpov, S., Plokhotnichenko, V. L., et al. 2013, August, Phys. Usp., 56, 836. https://doi.org/10.3367/UFNe.0183.201308i.0888

[5] Beskin, G., Karpov, S., Bondar, S., et al. 2014, December, Rev. Mexic. Astron. Astrofis. Conf. Ser., 45, 20

[6] Beskin, G., Karpov, S., Biryukov, A. V., et al. 2017, January, Astrophys. Bull., 72, 81. https://doi.org/10.1134/S1990341317030105

[7] Høg, E., Fabricius, C., Makarov, V. V., et al. 2000, March, A&A, 355, L27

[8] Karpov, S., Katkova, E., Beskin, G., et al. 2016a, December, Rev. Mex. Astron. Astrofis. Conf. Ser., 48, 112

[9] Karpov, S., Orekhova, N., Beskin, G., et al. 2016b, December, Rev. Mex. Astron. Astrofis. Conf. Ser., 48, 97

[10] Karpov, S., Beskin, G., Biryukov, A., et al. 2017a, June, in: Stars: From Collapse to Collapse, eds. Y. Y. Balega, D. O. Kudryavtsev, I. I. Romanyuk, et al., San Francisco, Vol. 510, 526

[11] Karpov, S., Beskin, G., Biryukov, A., et al. 2017b, in: New Frontiers in Black Hole Astrophysics, ed. A. Gomboc, Cambridge, Vol. 324, 85. https://doi.org/10.1017/S1743921317001259

[12] Karpov, S., Beskin, G., Biryukov, A. et al. 2018, in: Mini-MegaTORTORA wide-field monitoring system with sub-second temporal resolution: observation of transient events, Proc. Int. Conf. “SN 1987A, Quark Phase Transition in Compact Objects and Multimessenger Astronomy”, Russia, Terskol (BNO INR RAS), Nizhnij Arkhyz (SAO RAS), July 2–8, 2017, 86–95. INR RAS

[13] Lang, D., Hogg, D. W., Mierle, K., Blanton, M., & Roweis, S. 2010, May, AJ, 139, 1782. https://doi.org/10.1088/0004-6256/139/5/1782

[14] Pickles, A., & Depagne, É. 2010, December, PASP, 122, 1437. https://doi.org/10.1086/657947

[15] Skrutskie, M. F., Cutri, R. M., Stiening, R., et al. 2006, February, AJ, 131, 1163. https://doi.org/10.1086/498708

[16] Sokolovsky, K. V., Gavras, P., Karampelas, A., et al. 2017, January, MNRAS, 464, 274. https://doi.org/10.1093/mnras/stw2262

[17] Tamuz, O., Mazeh, T., & Zucker, S. 2005, February, MNRAS, 356, 1466. https://doi.org/10.1111/j.1365-2966.2004.08585.x

[18] Vanderplas, J. 2015a, February, Gatspy: General tools for Astronomical Time Series in Python. https://doi.org/10.5281/zenodo.14833

[19] Vanderplas, J. 2015b, January, Supersmoother: Efficient Python Implementation of Friedman's SuperSmoother. https://doi.org/10.5281/zenodo.14475

[20] Watson, C. L., Henden, A. A., & Price, A. 2006, May, Soc. Astronom. Sci. Ann. Symp., 25, 47