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TITLE: Binary central stars of planetary nebulae in the Large Magellanic Cloud

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ABSTRACT: Context. Close binary central stars of planetary nebulae must have formed through common envelope evolution during giant phase experienced by one of the stars. Transfer of the angular momentum from the binary system to the envelope leads to the shortening of the binary separations from the radius of red giant to the radius of order of few tenths of AU. Thus close binary central stars of planetary nebulae are laboratory to study common envelope phase of evolution. Close binary fraction in the Galaxy has been measured in various sky surveys, but close binary fraction is not yet well constrained for Magellanic Clouds and our results may help study common envelope evolution in low metallicity environments. Aims. This paper presents continuation of our study of variability in the Magellanic Clouds planetary nebulae (PNe) on the basis of data from the Optical Gravitational Lensing Experiment (OGLE). Previously, we had analysed the OGLE data in the Small Magellanic Cloud. Here, this study is extended to the Large Magellanic Cloud (LMC). In this paper we search for close binary central stars with the aim to constrain the binary fraction and period distribution in the LMC. Methods. We identified 290 counterparts of PNe in the LMC in the I-band images from the OGLE-III and OGLE-IV surveys. However, the light curves of 10 objects were not accessible in the OGLE database, thus we analysed the time-series photometry of 280 Pne. Results. In total 32 variables were found, but five of them turned out to be foreground objects. Another 18 objects show irregular or regular variability which is not attributed to binarity of their central stars. Their status and nature of their variability will be verified in the follow-up paper. Nine binary central stars of PNe with periods between 0.24 and 23.6 days were discovered. The obtained fraction for the LMC PNe is of 3.3+2.6 −1.6% without correcting for incompleteness. This number is significantly lower than 12–21% derived in the analogous search in the Galactic Bulge. We discuss this difference, taking into account observational biases. Lower binary fraction suggests smaller efficiency of the common-envelope phase in producing close binaries in the LMC compared to the Galaxy.