Title: Doubly-eclipsing systems

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Abstract: The study of doubly-eclipsing systems also brings new knowledge about quadruple stellar systems as such. And therefore the goal of our work was to create an algorithm for detecting candidates for doubly-eclipsing systems. We had photometric data available from the OGLE project from the Small Magellanic Cloud. After evaluating all the data with our semi-automatic program we selected 74 objects which were further analyzed in PHOEBE. We have obtained 11 new candidates for doubly-eclipsing systems for which we were able to derive both eclipse periods (other 15 candidates in SMC are already known). This gives us only 0.3 % of all binary stars in the SMC for candidates for doubly-eclipsing systems. Out of the 11 new candidates, we detected some variations indicating a common orbit for 6 of them based on the analysis of the O – C diagrams, namely: OGLE SMC-ECL-1086, OGLE SMC-ECL-2339, OGLE SMC-ECL-2515, OGLE SMC-ECL-3075, OGLE SMC-ECL-4756 and OGLE SMC-ECL-6093. Their mutual orbital period was obtained in the range of 4 to 15 years. This means that these candidates are probably bound 2+2 systems.

Keywords: eclipsing binaries, multiple systems, fundamental parameters, photometry