

Developing a user-friendly photometric software for exoplanets to increase participation in Citizen Science

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Abstract

Previous research on Citizen Science projects agree that Citizen Science (CS) would serve as a way of both increasing levels of public understanding of science and public participation in scientific research. Historically, the concept of CS is not new, it dates back to the 20th century when citizens were making skilled observations, particularly in archaeology, ecology, and astronomy. Recently, the idea of CS has been improved due to technological progress and the arrival of Internet. The phrase “astronomy from the chair” that is being used in the literature highlights the extent of the convenience for analysing observational data. Citizen science benefits a variety of communities, such as scientific researchers, volunteers and STEM educators. Participating in CS projects is not only engaging the volunteers with the research goals of a science team, but is also helping them learning more about specialised scientific topics. In the case of astronomy, typical examples of CS projects are gathering observational data or/and analysing them. The Holomon Photometric Software (HOPS) is a user-friendly photometric software for exoplanets, with graphical representations, statistics, models, options are brought together into a single package. It was originally developed to analyse observations of transiting exoplanets obtained from the Holomon Astronomical Station of the Aristotle University of Thessaloniki.

Here, we make the case that this software can be used as part of a CS project in analysing transiting exoplanets and producing light-curves. HOPS could contribute to the scientific data analysis but it could be used also as an educational tool for learning and visualizing photometry analyses of transiting exoplanets. Such a tool could be proven very efficient in the context of public participation in the research. In recent successful representative examples such as Galaxy Zoo professional astronomers cooperating with CS discovered a group of rare galaxies by using online software. Also the project “planet hunters” asked people to discover planets in other solar systems using data from large telescopes. HOPS, being in the same direction, could be an effective way of participating in research whether as an amateur astronomer or as a person of the general public that wants to engage with exoplanetary research and data analysis. The software is free of charge under the scope of astronomical research and education. We plan to create an online platform, inspired by HOPS, in the near future. In this platform, everyone will have access by creating an account as a user. Amateur astronomers, who have obtained their own exoplanet observations, will be able to upload and analyse their data. For people who are not familiar with photometric analysis – amateurs or general public users – data, as well as educational video and audio material will be provided.