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Milagros Colazo (UAM), Developing algorithms for Phase Curve analysis using DP03 Simulated Data in the LSST era

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Asteroids are remnants of planetary formation. Their current physi- cal properties and orbital distribution are related to their initial state in the early Solar System and their subsequent dynamic and physical evo- lution. The phase curves of asteroids relate to the variation of integrated brightness in the disk over the phase angle (the angle between the Sun and the observer, as seen from the object), providing information linked to surface characteristics. By fitting a phase curve, the most important parameters that can be determined are the H, G1, G2, and G12 . With the era of the LSST, a large amount of data will be provided to the sci- entific community, including information about the Solar System. The main objective of this project is to develop software capable of obtaining phase curves for a catalog of the magnitude that LSST will produce. The first goal of this work is to improve our tools for fitting phase curves of asteroids using photometric data obtained by the LSST, and to include the rotational phase. Then, we will construct a catalog of phase curve parameters and perform various statistical analyses. The next step will be to combine the LSST database with other surveys. Finally, we will study the taxonomy of asteroids using the obtained phase parameters, which will allow us to deepen our understanding of these objects. Currently, we have DP0.3, which is a hybrid catalog containing both real and simulated Solar System objects. Based on it, we have generated some tests with the codes we have already developed for analyzing large databases and have compared them with what we obtained for ATLAS survey. In this presentation, we will share these preliminary results.

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