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## The Optical Two- and Three-Dimensional Fundamental Plane Correlations for More than 130 Gamma-Ray Burst Afterglows

*Tuesday, July 6, 2021 8:10 AM (20 minutes)*

A large fraction of gamma-ray burst (GRB) light curves (LCs) exhibit plateaus in their afterglow. Since GRBs phenomena are panchromatic in nature, emitting wavelengths from X-ray to radio, there is opportunity to study GRBs along multiple electromagnetic regimes. In this work, we further investigate more than 130 GRBs that show optical plateaus in their LCs. We confirm the two-dimensional fundamental plane correlations between the rest-frame end time  $T_{opt}^*$  and luminosity  $L_{opt}^*$  at the end time with our enhanced dataset and, using a subset of more than 45 GRBs exhibiting prompt peaks in their LCs in the optical, confirm the existence of a three dimensional correlation between  $T_{opt}^*$ ,  $L_{opt}^*$ , and the peak luminosity,  $L_{peak}^*$ . This represents the largest compilation thus far of optical plateaus. We also explored the GRBs observed by the Subaru Telescope and checked how the Subaru Telescope can fill in the orbital gaps in the Swift observations, for example.

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**Session Classification:** Gamma-Ray Burst Correlations: Observational Challenges and Theoretical Interpretation

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