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## *Experimental Challenges in Cosmology: Reducing Power Output with Multiplexed Data Transmissions*

Cosmology is a specific branch of physics that studies the structure and properties of the universe in order to understand and describe the formation, evolution, and fate of the universe. Large advancements in this field have been made in recent years, one of which includes the discovery that the Cosmic Wave Background Radiation (CMB) is polarized. EBEX (E and B eXperiment) is one project planning on mapping this finding in much greater detail. One major difficulty in accomplishing this stems from the extremely small size of the signal being detected, often times smaller than the inherent noise contained in normal experimental systems. To reduce this noise, these systems are cooled to cryogenic temperatures. Maintaining this extremely cold state is a challenge, especially when the means of cooling the system are limited. Therefore, strategies for reducing the power output of the various components contained within the system need to be utilized. One of these strategies, which my research has focused on, addresses reducing the power output of the electronics used for signal detection and acquisition. Multiplexing the data transmissions lowers the number of components needed and draws less current, thereby decreasing the overall power and noise output of the system.



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