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The Use of a Burn-In Station for stress-testing and reliability studies in particle physics instrumentation

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Abstract. Electronics, in general, experience a high mortality rate in the first few months of their use - this is especially true for particle physics instrumentation, where electronic components are subjected to high temperatures, constant loads, and radiation. This environment necessitates the development of a process to test the performance and reliability of the electronics to mitigate the risk of early-life failures. A burn-in station is a sophisticated testing station which emulates the high-stress environment the electronics would experience, in order to artificially age them; data can be collected on the input and output currents and voltages and temperatures, which can be graphed to find behaviour trends. The test station, and the data collected from running it, can then be used for reliability studies on the instrumentation and to create a predictive model as a preemptive warning system to alert technicians in advance if a component is likely to fail.

Primary author: WILKINSON, Tristan Jade (University of the Witwatersrand)

Presenter: WILKINSON, Tristan Jade (University of the Witwatersrand)

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