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Cleaning Data for Dark Matter Detection

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DEAP-3600 is a liquid argon based dark matter experiment located 2km underground in VALE's Creighton mine, Lively, Ontario. In 2016, DEAP-3600 completed its commissioning phase and began collecting data for the objective physics search; the direct detection of spin-independent dark matter through pulse shape discrimination. In order to achieve the unprecedented levels of sensitivity required for such a measurement, a series of data cleaning procedures are applied to the data in order to remove the degrading effects of anomalous instrumental and environmental effects. Such examples include seismic activity and temperature fluctuations in the systems that maintain the necessary cryogenic conditions of the liquid argon. The identification of such effects in the data is first presented alongside the methods used to remove them. This is followed by a discussion of the signal acceptance and exposure for the first dark matter data set.

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