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The supply voltage apparatus of the CUORE experiment

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The Electronics system of experiments for the study of rare decay, such as double beta decay, must be very stable over the very long expected runs. We introduce our solution for the power supply of such an experiment, CUORE. The power supply chain consists in this case of a series of ACDC's, followed by DCDC's and then linear regulators. We emphasize here our approach to the DCDC regulation system that was designed with a complete rejection of the switching noise, across 50 MHz bandwidth. In the experimental layout the DCDC will be located far from the very front-end, with long connecting cables (10 m). We introduced our very simple and safe solution to prevent huge overvoltages, due to the energy stored in the cable, generated after the release of accidental short circuits, so avoiding destructive effects. Some microcontrollers take care of the DCDC operation and from the control room the managing and monitoring of every DCDC is possible via CAN BUS protocol, coupled via optical fibres. CUORE is an array of 1000 cryogenic detectors that will need 30 of our DCDC's in its final setup. Production results and statistics will be shown.

Collaboration

CUORE

Summary

The description of the power supply system of the CUORE experiment at Gran Sasso

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