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The Calibration System Based On the Controllable UV/visible LED Pulser for the Veto System of the DarkSide Detector

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A prototype of the calibration system for the Liquid Scintillator Veto (LSV) and Water Cherenkov Veto (WCV) of the DarkSide detector have been developed. The instrument consists of a fast double output flasher which can be configured and controlled via USB, the appropriate application software. UV, visible or combination of both LEDs could be installed. Flashes amplitude, repetition rate and delay time between two continuous pulses are adjustable. High –OH silica fibers are used to minimize intensity losses on the delivery path. X shape splitter is used to combine two LED's pigtailed output and then to split the sum of the signals. One output feeds calibration path to the detector, while the second is used for pulse-to-pulse measurement of the flash intensity with compatible photodiode in combination with Flash ADC. The instrument allows to simulate point physical events in very wide energy range from a few hundred keV up to several dozen of MeV. Additional studies (pile-up analysis, spatial reconstruction, quenching as a function of position and wavelength) can be performed due to double-LEDs scheme and possibility of fast replacement of diodes.

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