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Pulse Shape Discrimination in Liquid Argon and its application in background rejection for the DarkSide20 Dark Matter experiment.

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The DarkSide20k experiment is a direct Dark Matter detector focused on the search for WIMP dark matter. Its main component is a dual-phase Argon Time Projection Chamber (TPC). Here, particles are detected from collisions with Argon atoms and the subsequent emission of scintillation light as well as ionisation electrons. Since the rate of signal events is expected to be much lower than background events, understanding and rejecting the background is crucial.

A major advantage of Argon is the ability to discriminate between electron and nuclear recoil events based on the time profile of the scintillation pulse. This technique is called Pulse Shape Discrimination. In my presentation I will present aspects of the PSD technique as well as its importance within the analysis framework of the experiment and the projection of sensitivity limits.

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