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The Darkside-20k experiment

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The DarkSide program for direct dark matter detection is a global collaboration of all the current argon-based dark matter experiments. The Darkside-20k detector will be located in the Laboratori Nazionali del Gran Sasso. It is designed to be experimental-background free and is optimized for sensitivity to high-mass WIMPs. Darkside-20k consists of an inner dual phase liquid argon (LAr) TPC detector and a surrounding argon veto detector, hosted inside a Proto-DUNE-like cryostat. The inner detector employs argon from underground sources in order to reduce the background produced by the beta-decay of the 39Ar isotope. The total mass of LAr in the inner detector is 50t. The veto detector consists of a Gadolinium-loaded plastic shell, sandwiched between two active natural LAr buffers, with total mass of 750 tonnes. The inner and veto detectors are both read out with novel, large-area silicon photo-sensors developed in a 5 year R&D programme together with Fundazione Bruno Kessler. I will present the current status of the Darkside-20k development, in particular I will focus on the performance studies of the veto system.

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