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The DEGAS Detector

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The development of the electrically cooled massive HPGe Detectors is driven by the development of the DEGAS (DEspec Germanium Array Spectrometer) detector which is in the heart of the DESPEC (DEcay SPECtroscopy) Project at GSI and FAIR. DESPEC is to utilize 28 DEGAS Detectors and each one has to comprise 3 encapsulated 60% HPGe crystals in a common cryostat. The detectors have to be placed as close as possible each other and very close to the target chamber (AIDA active target) in order to maximize the efficiency. Additionally, each crystal is to obtain a high efficient scintillator (Backcatcher) placed behind (with respect to the target chamber) and read out by a silicon photomultiplier (SiPM). The Backcatcher serves to absorb the forward scattered Compton photons and actively to protect the germanium crystals from the environmental gamma-background. Despite that DEGAS is to operate in a trigger mode, low background conditions are required for some specific experiments. Along the classic electronic assembly (preamplifier etc.), the detector has to carry onboard additional electronics –HV modules, power supplies, monitoring and slow control modules which are aimed at enhancing of its performance. All this specifics reflect on the structure of the detector and install sometimes contradicting requirements.

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