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The large-angle photon veto system for the NA62 experiment at CERN

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The branching ratio (BR) for the decay $K^+ \rightarrow \pi^+ \nu \bar{\nu}$ is a sensitive probe for new physics. The NA62 experiment at the CERN SPS will measure this BR to within about 10%. To reject the dominant background from channels with final state photons, the large-angle vetoes (LAVs) must detect photons with energies as low as 200 MeV with an inefficiency of less than 10^{-4} , as well as provide energy and time measurements with resolutions of $\sim 10\%$ and 1-ns for 1 GeV photons. The LAV detectors make creative reuse of lead-glass blocks recycled from the OPAL electromagnetic calorimeter barrel. We describe the mechanical design and challenges faced during construction, the development of front-end electronics to allow simultaneous time and energy measurements over an extended dynamic range using the time-over-threshold technique, and the development of an in-situ calibration and monitoring system. Our results are based on test beam data collected using prototypes of the LAV detectors.

for the collaboration

for the LAV working group of the NA62 Collaboration

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