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Nuclear Astrophysics at the LENA facility: The γ -ray detection system. RICHARD LONGLAND, CHRISTIAN ILIADIS, ARTHUR CHAMPAGNE, CHRIS FOX, JOE NEWTON, University of North Carolina — Details of the detection system used at The Laboratory for Experimental Nuclear Astrophysics is described, including methods for measuring weak capture- γ -ray resonances. $\gamma\gamma$ -coincidence techniques with a large solid angle NaI(Tl) annulus are described, as well as their effects on background count rates in the energy regions of interest at LENA. In order to reduce the background further, cosmic muon induced counts can be decreased with the aid of an anti-coincidence plastic scintillator shield. In order to create a compact detection system, a novel, wavelength shifting fibre method of light readout has been used. These techniques are shown to reduce background count rates significantly for cascade decays in our regions of interest, and are shown to have a significant improvement over our previous results.

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