

# The HIBEAM/NNBAR Calorimeter Prototype

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The HIBEAM/NNBAR experiment is a free-neutron search for  $n \rightarrow n\bar{b}$  and  $n \rightarrow \text{sterile } n$  oscillations to be housed at the ESS in Lund, Sweden. The detector will be capable of identifying  $n$ - $n\bar{b}$  annihilation events, which will produce on average  $\sim 4$  pions with a final state invariant mass of  $\sim 1.9$  GeV. The detector will feature a novel calorimeter design, which must provide good resolution of the point of impact of gammas from  $\pi^0$  decay and sufficient energy resolution to reconstruct the sum of two nucleon masses. Calorimetry for these energies is challenging, as traditional sampling calorimeters used in HEP would suffer from degraded resolution from poor shower statistics. The calorimeter instead uses a hybrid approach of a range measurement in plastic scintillators implementing a binary readout, followed by total absorption in lead glass. This talk presents work towards a prototype calorimeter which is planned to be deployed in the ESS Test Beam Line for *in situ* background measurements.

## TIPP2020 abstract resubmission?

No, this is an entirely new submission.

## Funding information

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