

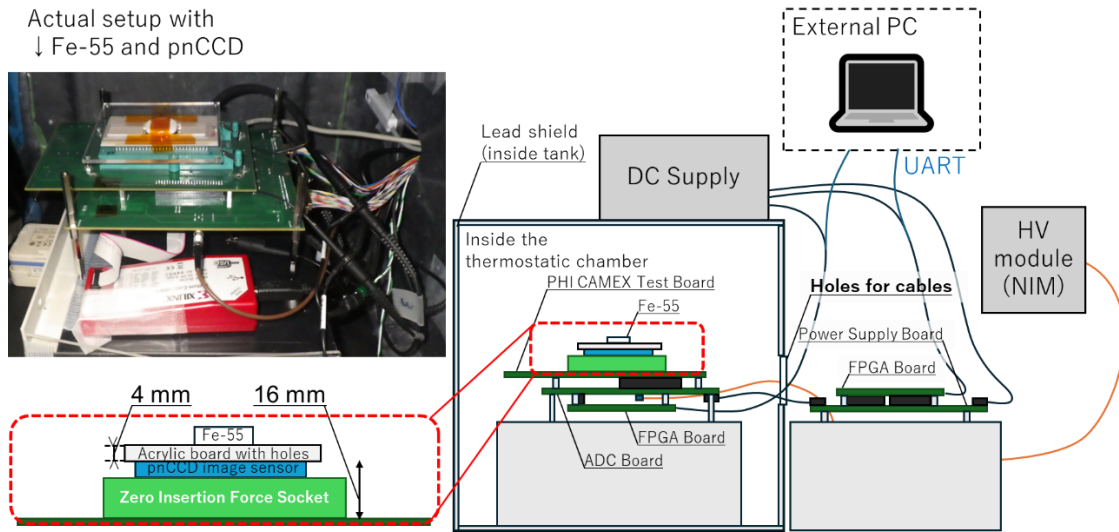


Fig 1. Overview of the assembled pnCCD drive and readout system and experimental setup for X-ray irradiation testing. The photo shows the actual system inside the thermostatic chamber.

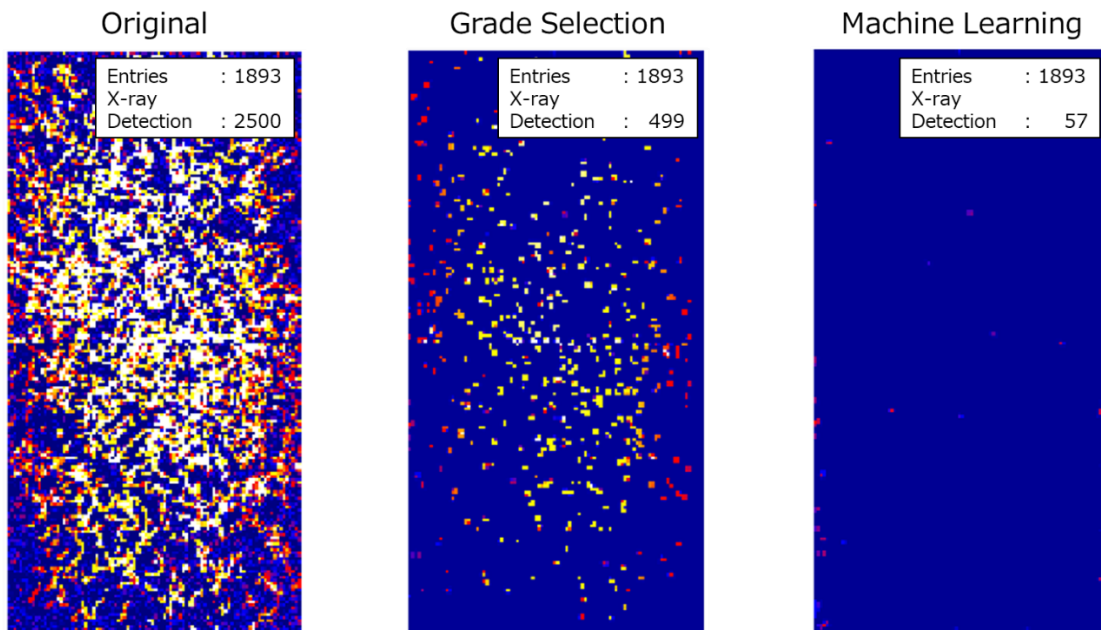


Fig 2. Beta rays were irradiated using an Sr-90 source, and 100 frames were captured with an exposure time of 25 ms. Left: Flux map in which events were determined without selecting X-rays or electron rays. Center: Flux map in which only electron rays were removed using the conventional grading method. Right: Flux map in which electron rays were removed using a model trained with X-ray events and electron ray events using machine learning.