Source/X-ray gun Follow-up

- Chips after irradiation
  - From discussion with Julien
- X-ray gun infos
  - From Hide Oide (Japanese cluster)

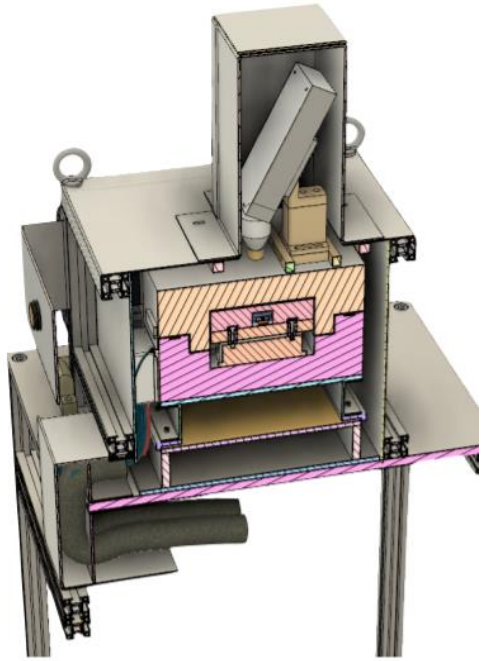
Chips after irradiation

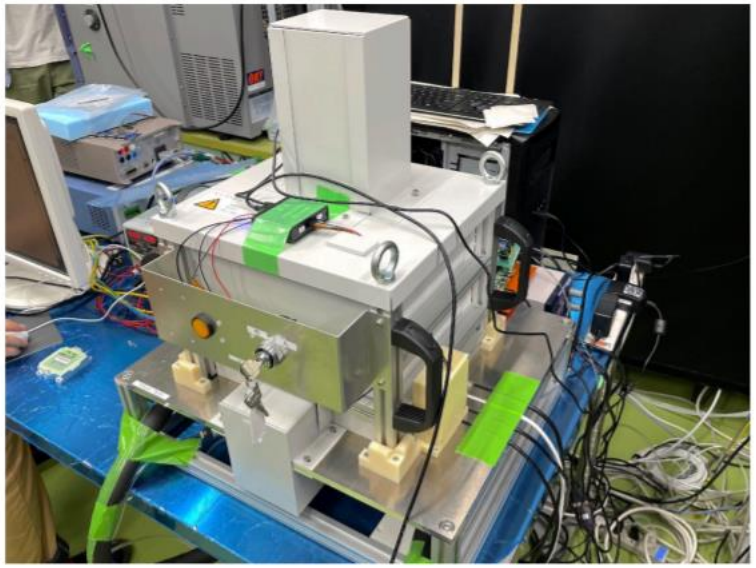
- Status
  - Considered by ASN as **unsealed** sources
  - Then considered as nuclear waste
    - Not handled by official waste recycling agency
- Next
  - Best solution is to perform tests where they are stored (CERN, …)
  - If needed physically at LPNHE
    - Need authorization procedure to be performed
      - Long and heavy
    - To be checked with Marco

X-ray gun infos (1)

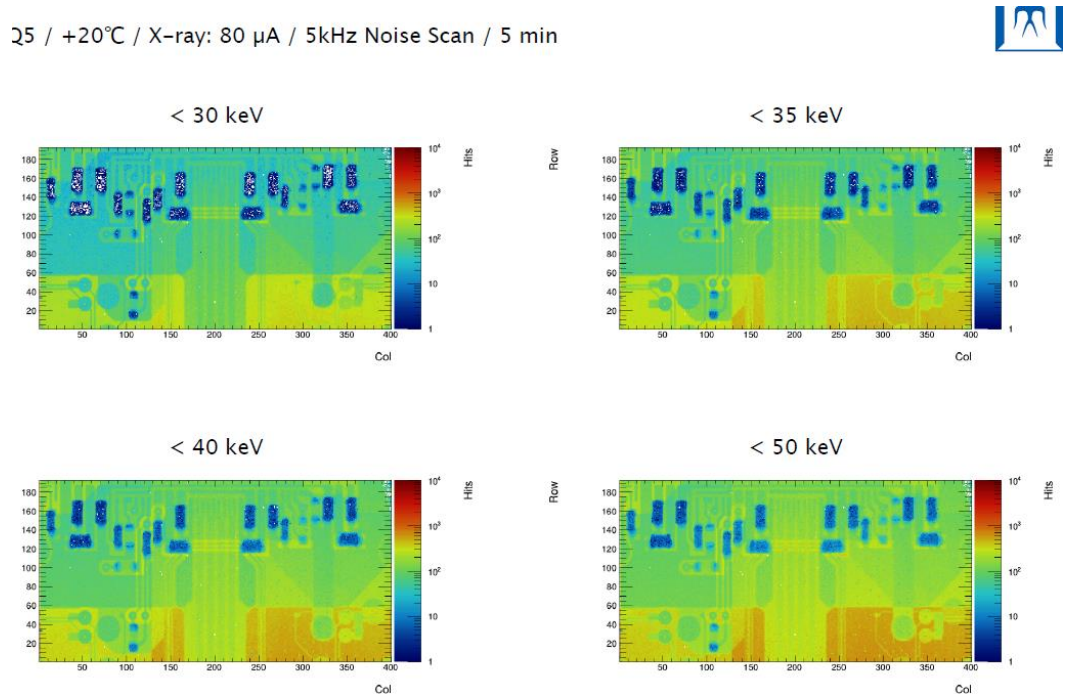
- Amptek mini x-ray tube at CERN. Not used it for module QC but for x-ray fluorescence measurements (Lingxin)
  - Costs about 7-8kCHF - Lifetime 40k hours
- Used by Japanese cluster
  - https://indico.cern.ch/event/1006217/contributions/4224232/attachments/2187037/3695518/20210209_2ndQCQual_Japan.pdf
  - Sufficient hits to each pixel in several minutes at full power (50kV, 80 μA)
  - Shield cover "removable" by hands (easy access to cooling box & tube can be used for multiple cooling boxes in future)
  - Dedicated work on shield with Geant4
  - Interlock to be implemented. Interface provided by tube itself
  - Cost 10k$ + Shield 3k$s

X-ray gun infos (2)





- Tube stays at room temperature
  - No pb to go throught the foam
  - For use with cold box
- Tube aperture +- 60°
  - Collimator installed



- Expect O(100) hits / chip / bunch-crossing by full-power & random triggers @ 5 kHz
- Under SMDs only several hits present / 5min illumination
  - Minimum hits requirement / pixel to be appliedfor pixels under SMDs?