Project Update

RIKEN/RBRC
Itaru Nakagawa

postgres-SQL Database

- On 2022/08/24 22:15, pinkenburg wrote:
- Hi Itaru,

  there is no plan to run MySQL, we have neither the expertise nor the manpower for this. We do have a postgres server in sdcc (sphnxdbmaster), Martin runs a postgres server in 1008 (which is where I think you want to keep your online parameters). We can create databases but the setup (designing, creating and filling/reading tables) is something you will have to implement.

  Chris

  On 8/24/2022 2:01 AM, Itaru Nakagawa wrote:
  Hi Chris,

  We INTT group would like to start using sPHENIX database to keep our online parameters. Are there any instruction available somewhere? I've searched sPHENIX wiki page with "SQL" as the keyword, but couldn't find any relevant information.

  Regards,

  -itaru

To be requested online database to keep the INTT online parameters. We should start compiling the necessary parameters and come up with a structure.

Cheng-Wei's Masters Thesis

國 立 中 央 大 學

物 理 學 系
碩 士 論 文

Assembly and Beam Test Analysis of sPHENIX INTT Detector

研 究 生 ：施承瑋
指導教授：郭家銘

3.4 Ladder assembly procedures

To assemble the INTT ladder, we designed the assembly tools specialize for the geometries of the INTT components, the design drawing is shown in Figure 3.19. The tools were produced at the CNC machine shop of Academia Sinica (AS), Figure 3.20 shows the photo of assembly tools installed on the gantry table. The assembly tray is for placing the baseplate components, the HDI, and stave. They are fixed on the tray by vacuum. The chips and sensors are placed on the component tray, they will be picked up by the pick up tool and assembled onto HDI.

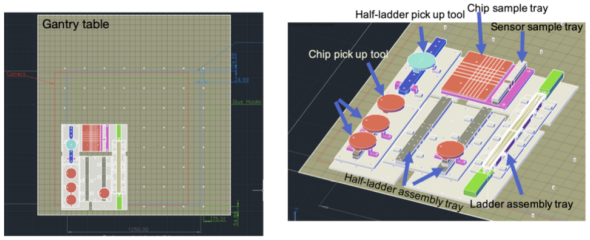
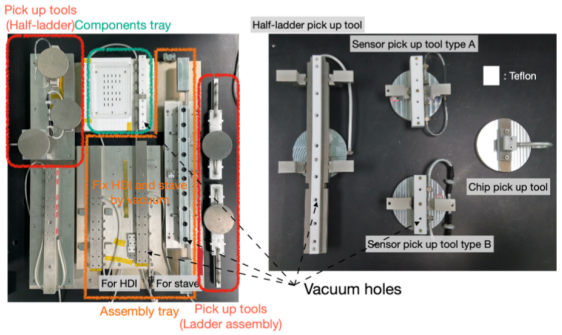


FIGURE 3.19: The design drawing of the assembly tools.



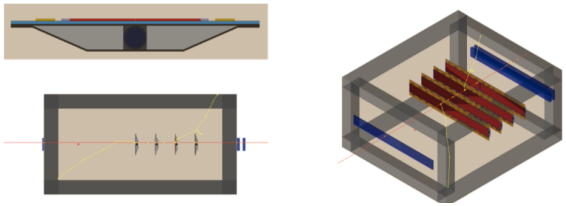
5.3.3 Coulomb scattering study

A good understanding of multiple Coulomb scattering of relativistic particles in the INTT is important for the tracking system and calorimeter. The scattering angular distribution is not just a Gaussian distribution, it has a long tail at either side. For the target with low material budget, the scattering angular distribution can be described by equation 5.2 from the paper [33].

$$f(\theta) = N \cdot \Big((1-a) \cdot \frac{1}{\sigma_G \sqrt{2\pi}} e^{-\frac{(\theta-\mu)^2}{2\sigma_G^2}} + a \cdot \frac{\Gamma(\frac{\nu+1}{2})}{\sqrt{\nu\pi}\sigma\Gamma(\frac{\nu}{2})} (1 + \frac{(\theta-\mu)^2}{\nu\sigma^2})^{-\frac{\nu+1}{2}} \Big). \tag{5.2}$$

The former is the Gaussian distribution, and the latter is the Student's t distribution. The equation has six free parameters, the normalization term N, relative fraction a of the Student's t distribution, the mean value μ shares to both distributions, the width of the Gaussian σ_G, the width σ of Student's t, and the parameter ν to describe the tails. The parameter ν is of importance in this study. For $\nu \to \infty$, the Student's t distribution turns into a Gaussian, whereas for $\nu \to 1$, the tails get more pronounced.

Since there were 3 layers of INTT ladders functional in the testbeam 2021, the scattering at layer-1 can be checked. The Geant4 model of the testbeam 2021 is built as well, shown in Figure 5.19. All the components of the INTT ladder are included. The study of the scattering angle distribution is performed with simulation as well. The scattering angle at layer-1 is calculated by "slope-3 - slope-2", as demonstrated in Figure 5.20. The results of the data and MC are shown in Figure 5.21. From the fitting, the ν parameter of data is 1.0425 while the MC is 2.0756. The discrepancy between the data and MC requires further investigation.



Packet ID

- Needs to be re-shuffled based on Martin’s suggestion :

1 packet-ID/FELIX.