Simulation Session

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PIONEER Collaboration Meeting — June 19, 2024

Introduction

Goals of the session

- Overview of the simulation activities

- Prepare us for the discussion 'toward the CDR' on Friday

  What are the most pressing questions that the simulation needs to address?

  What is missing in the simulation?

- Five areas:

  - Detector design ('secondary' detectors and upstream region)
  - Physics modelling
  - Detector response
  - Event Reconstruction and tagging
  - Beam specifications

Introduction
Goals of the session

	Introduction	*Quentin Buat*
	Conference Room, CENPA	*13:00 - 13:10*
Status overview	**PIONEER Simulation: Overview, Status, and Opportunities for Improvement**	*Patrick Schwendimann*
	Conference Room, CENPA	*13:10 - 13:25*
Detector response	**ATAR resolution and dead material**	*Jessie Yang*
	Conference Room, CENPA	*13:25 - 13:45*
Event Tagging	**Pion Decay In Flight Suppression with ATAR**	*Adam Molnar*
	Conference Room, CENPA	*13:45 - 14:05*
Event Reconstruction	**Acceptance Studies**	*Yousen Zhang*
	Conference Room, CENPA	*14:05 - 14:25*
	Welcome Tea	
	Conference Room, CENPA	*14:25 - 14:55*
'secondary' detectors	**Role of the Tracker in PIONEER and Possible Implementations**	*Jaydeep Datta et al.*
	Conference Room, CENPA	*14:55 - 15:15*
Event Reconstruction	**Optical Photons and Pileup Treatment for the LXe Calorimeter**	*Benjamin Davis-Purcell*
	Conference Room, CENPA	*15:15 - 15:35*
Event Reconstruction	**Calorimeter Reconstruction with a Segmented LYSO Detector**	*Omar Beesley*
	Conference Room, CENPA	*15:35 - 15:55*
Physics modelling	**Radiative Decays**	*Patrick Schwendimann*
	Conference Room, CENPA	*15:55 - 16:15*
Status overview	**LFU Analysis: Strategy, Sensitivity Study and Simulation Results**	*Quentin Buat*
	Conference Room, CENPA	*16:15 - 16:30*

PIONEER Simulation Effort
Software Workshop

Software Workshop

Software Workshop

Inspired by the very successful event hosted at UW in February, we aim for a similar workshop the week after the Collaboration Meeting (Mon 24. June to Fri 28. June 2024). The report of the last session can be found here:

https://pioneer.npl.washington.edu/cgi-bin/private/ShowDocument?docid=242

This is an opportunity for all people that are working on the software development side or intend to do so in the near to intermediate future. In order to participate, you have to figure an initial problem you want to tackle and have an idea where you want to get to eventually. This can range from modifying the geometry slightly and run the simulation (e.g. dead material studies) up to finessing a reconstruction algorithm and merge it with the main pipeline.

This offers each participant to discuss the ideas and problems with peers as well as to learn from their experiences. It will also be a very productive week where we are going to shape the future of the software framework used in PIONEER.

If you already know that you want to participate and the problem you wish to solve please sign up here:

https://docs.google.com/forms/d/e/1FAIpQLScG9XKXpiqq3jwh0mDmq72jIRKOElCcHlEAtHPxfLRvKAMkmw/viewform

Of course walk-ins are welcome as well. However, by knowing expectations beforehand allows us to prepare accordingly.

First PIONEER Software bootcamp

June 24 to June 28

Book-keeping

- Keeping track of the studies performed or to be performed:

  - Google doc: <u>Simulation Task List</u>

  - Good starting point for people looking to contribute

PIONEER Simulation Tasklist