RSIDIS Analysis Meeting 2026-08-31 11:59(GMT-4:00)

Key Outcomes

The team is finalizing metadata and calibration checks to prepare for **Pass 1** analysis. Key progress includes the verification of the run list against the RCDB and the creation of a new standard.kinematics file. Calibration constants for the HMS Cherenkov and BCM scalars are largely consistent, though some specific PMT and current-range issues are being investigated.

Decisions Made

- **Kinematics Defaults:** Set the default particle mass to **electron mass** for all cases (including DIS runs and "out of beam" targets) to prevent analyzer crashes.
- **Kinematics File Cleanup:** The standard.kinematics file will be updated to include Phase 1 runs for consistency, while removing non-RSIDIS runs from six years ago to reduce file size.
- **BCM Calibration:** Use a **global fit** for BCM1 and BCM2 parameters across all runs; for BCM4A and 4C, use parameters from a single representative "middle" run.
- **Run Naming Convention:** Use the format [Spectrometer] [Run Type] (e.g., **SHMSHEEP** or **HMSHEE**), where the spectrometer detecting the electron is listed first.
- **Error Handling:** The ScalarCalib script must throw a **fatal error** if BCM param files are missing, rather than just a warning.

Progress & Status

- **Metadata Validation:** Ryan verified the run list, RCDB, and kinematics; most errors were found in standard.kinematics rather than the run list.
- **Cherenkov Calibration:** HMS Cherenkov constants are consistent within 2-3%. However, the heavy gas Cherenkov PMT2 shows differences up to 11%, though this is deemed low-impact given the average photoelectron count.
- **Drift Chambers:** SHMS drift chamber residuals appear stable, with outliers attributed to low statistics.
- **BCM Scalars:** Linear fits are used up to 50 μA, with a quadratic term applied above 50 μA.

- **Replay Machinery:** The Hcswif script was upgraded to support multi-segment replays by using a "-1" flag to replace all segments.

Risks & Blockers

- **Hcswif Environment:** The script incorrectly reads the user's local environment (e.g.,.cshrc), causing root version mismatches and SLURM failures.
- **Event Mismatches:** A discrepancy exists between scalar events and global events in some runs, potentially due to helicity decoding errors.
- **Aerogel Script:** Previous scripts were too slow (not finishing 25% of replays in three days); a new modularized version is currently running.

Action Items

- **Ryan:** Create a pull request for the updated standard.kinematics file today.
- **All students (excluding Ryan) + Deb:** Provide the run list for quality assurance replays.
- **Radwan:**
    - Generate param files for the quality assurance runs.
    - Write a script to flag runs where the difference between scalar and global event numbers exceeds 10 events.
    - Provide a list of runs affected by coincidence time drift and "beta bump" issues.
- **Provakar:**
    - Merge Ryan's pull request and run the final replacement of the kinematics file.
    - Put all online replay files on tape for preservation.
    - Build new module files for hcana 1.5.2 and root 6.36 to ensure environment consistency.

Next Steps

- **Quality Assurance Replay:** Once run lists are collected and param files generated, Jefferson will perform a common replay of all requested runs.
- **Pass 1 Transition:** Following the QA replays and calibration checks, the team will move to **Pass 1** and subsequent physics analysis.
- **Meeting Schedule:** No meeting next week (Labor Day holiday); Provakar will be travelling during the following week's meeting.