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AMBER
Apparatus for Meson and Baryon Experimental Research

CERN

AMBER --> Feedback from CEDAR operation

Josef Novy

October 2024 Drell-yan run CEDAR performance

- **Measurements done**
  - Alignment runs
  - Diaphragm scan
    - 190 GeV positive, kaon and pion, 2e6, 20e6, 70e6, 160e6, 280e6, diaphragm 0.10, 0.20, 0.30, 0.35, 0.40, 0.45, 0.50, 0.55, 0.6 mm,(0.65,0.7,0.75,0.80,0.85,0.90,0.95,1 low intensity).
    - 190 GeV negative, both kaon peak, 20e6, 70e6, 160e6, 300e6, diaphragm 0.10, 0.20, 0.30, 0.35, 0.40, 0.45, 0.50, 0.55, 0.6 mm,(0.65,0.7,0.75,0.80,0.85,0.90,0.95,1 low intensity).
    - 160 GeV positive, kaon and pion, 70e6, 310e6, diaphragm 0.75, 0.65, 0.55, 0.45, 0.4 ,(0.35, 0.3, 0.2, 0.1 high intensity).
    - 160 GeV negative, both kaon peak, 20e6, 70e6, 160e6, 350e6, diaphragm 0.75, 0.65, 0.55, 0.45, 0.4.
  - 'Periscope' Test (Misalignment Test) (190 GeV negative, 2.9e8)
    - Aligned runs and misaligned runs (diaphragm 0.2mm and 0.4mm)
  - Normal Runs with Kaon Settings (190 GeV)
    - Smal changes of pressure around peak – problematic control
- **Highlights & Major issues faced**
  - Air contamination in CEDAR 2 and later CEDAR 1 – hard to diagnose and recover -> ~3 days lost
  - Precise pressure control of CEDARs problematic
  - A lot of different beam conditions take time to setup (beam tuning, CEDAR aligments etc.) – more time spend commisioning than measuring

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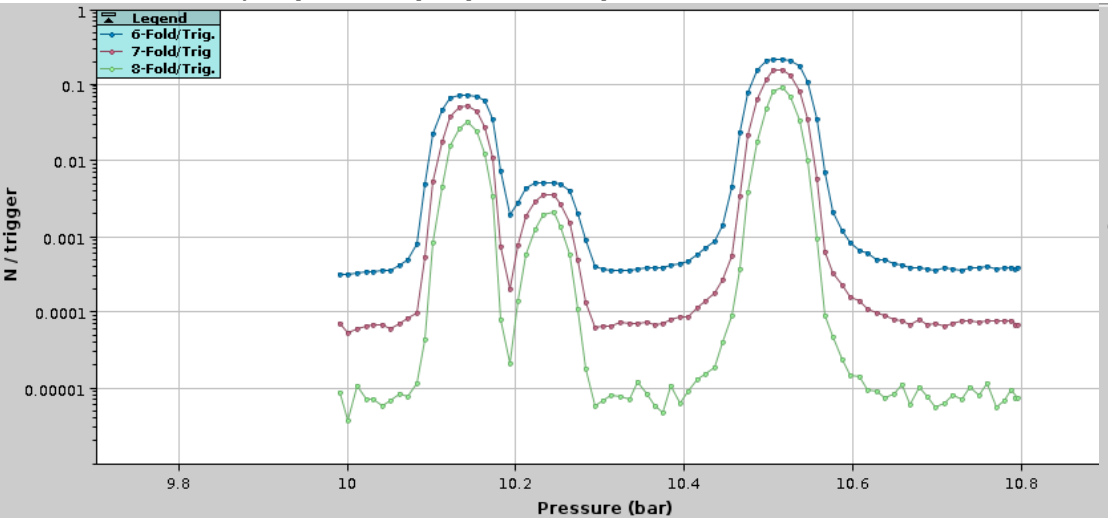
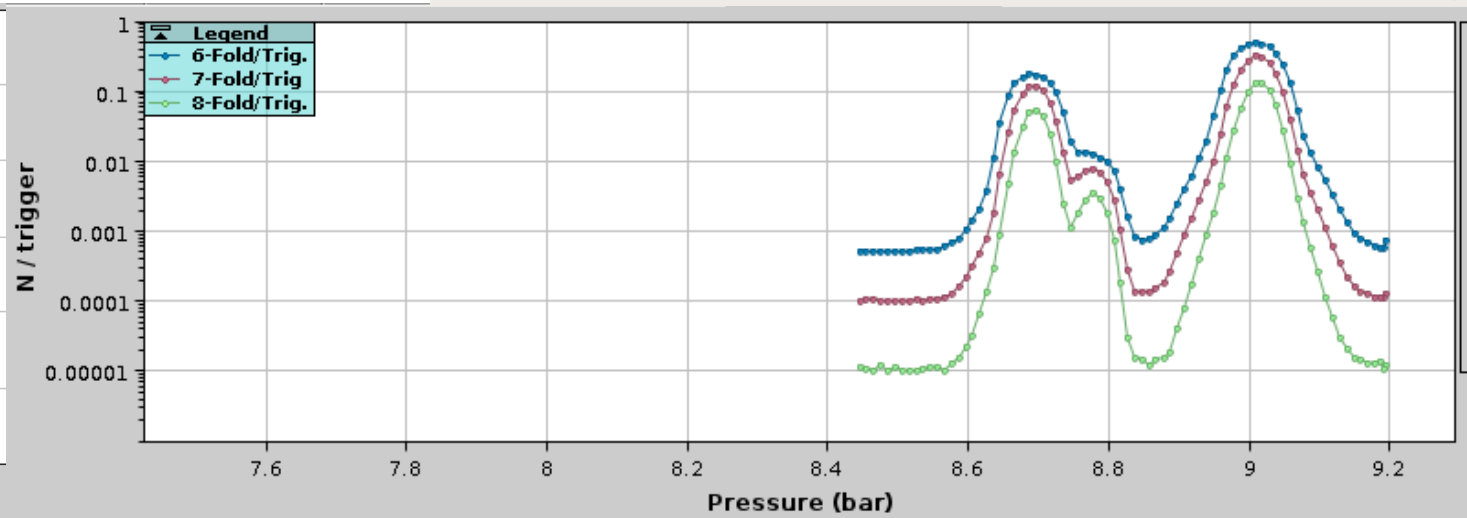
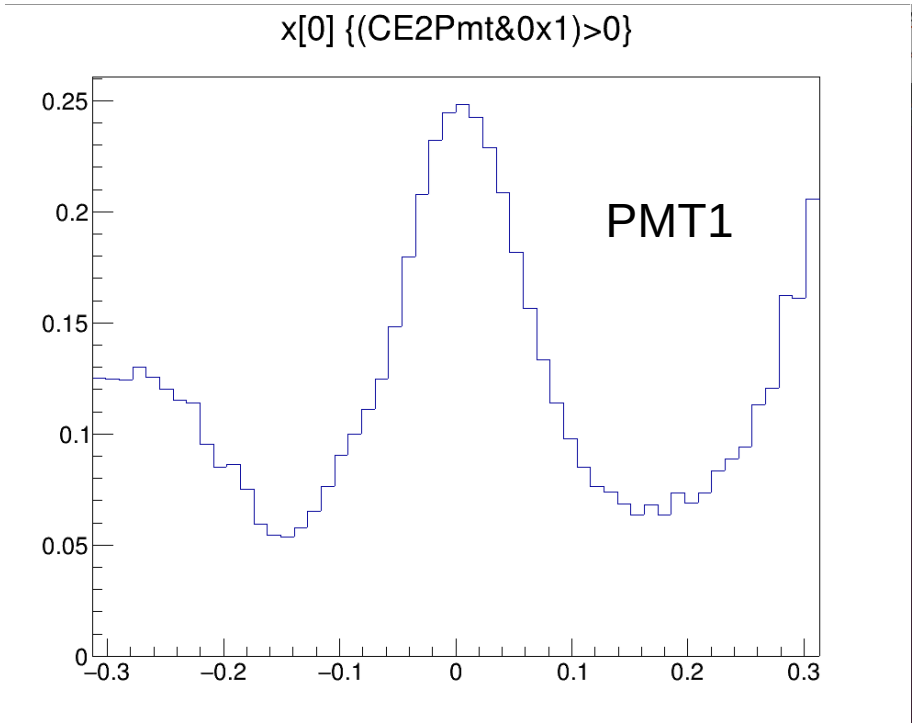
CEDAR operation – air contamination

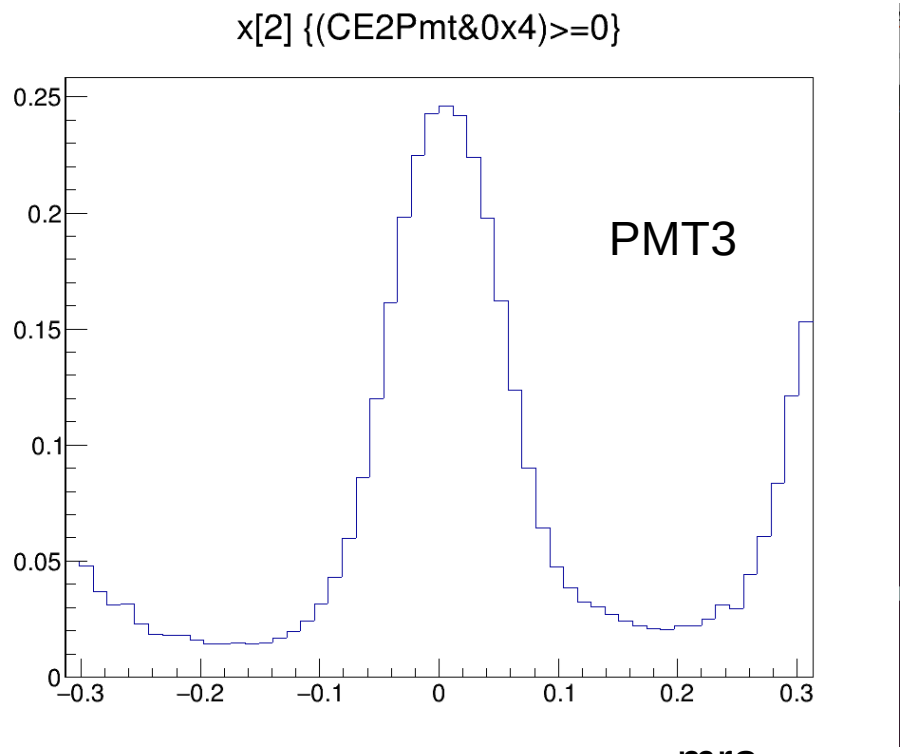
- **Initial Issue**:
  - Peak not found during pressure scan; wider scan revealed it much lower than expected.
- **Peak Movement**:
  - Peak position moved towards the expected value with each scan—indicating **air contamination**.
- **Verification**:
  - Issue confirmed by emptying to 3 bar and pressurizing back to 12 bar.
- **Refilling**:
  - System pumped to vacuum and refilled on Monday. **CEDAR 2** OK, but **CEDAR 1** showed similar problems.
- **Solution**:
  - Issue resolved by **cycling gas volume between 2 and 13 bar** for CEDAR 1.
- **Recommendation**:
  - Develop a **precise preparation procedure for CEDAR**.





Very good centering of CEDAR w.r.t beam





2024 - all PMTs less than 10urad from the center,

2023 - discrepancies up to 70urad seen….

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