First look at DIRC scalers & neutron counters during the aperture scan MD

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- Average scaler rates/rate ratios vs. HER & LER angles
- Average neutron rates/rate ratios vs. HER & LER angles
- Comparaison scalers/neutron counters for the 4 scans
- Summary
Locations of the neutron counters (side view)
Locations of the neutron counters (top view)

Backward

Forward

neutron_1_bckw

neutron_2_for

neutron_1_for
DIRC scalers; HER angles scan

Scal. rate (kHz)  Scal. rate ratio

HER X

HER Y
DIRC scalers; LER angles scan

Scaler rate (kHz)  Scaler rate ratio

LER X

LER Y
Neutron counter forward 1; HER angles scan

Neutron rate (kHz) | Neutron rate ratio

**HER X**

**HER Y**
Neutron counter forward 1; LER angles scan

Neutron rate (kHz)

Neutron rate ratio

LER X

LER Y
Neutron counter forward 2; HER angles scan

Neutron rate (kHz)  Neutron rate ratio

HER X

HER Y
Neutron counter forward 2; LER angles scan

Neutron rate (kHz)  Neutron rate ratio

LER X

LER Y
Neutron counter backward; HER angles scan

Neutron rate (kHz) Neutron rate ratio

HER X scan, neutron 2 rate

HER X scan, neutron 2 rate ratio

HER Y scan, neutron 2 rate

HER Y scan, neutron 2 rate ratio
Neutron counter backward; LER angles scan

Neutron rate (kHz)  Neutron rate ratio

LER X

LER Y
HER-X Angle Scan

DIRC scalers

Neutron counter backward

Neutron counter forward 1

Neutron counter forward 2
HER-Y Angle Scan

DIRC scalers

Neutron counter backward

Neutron counter forward 1

Neutron counter forward 2
LER-X Angle Scan

DIRC scalers

Neutron counter backward

Neutron counter forward 1

Neutron counter forward 2
LER-Y Angle Scan

DIRC scalers

Neutron counter backward

Neutron counter forward 1

Neutron counter forward 2
Summary (1/2)

• DIRC scalers like:
  ✓ HER-X angle above -16 mRad
  ✓ HER-Y angle around 2 mRad
  ✓ LER-X angle around 8.5 mRad
  ✓ LER-Y angle around -2 mRad

• Backward neutron counter likes:
  ✓ HER-X angle around -16.5 mRad
  ✓ HER-Y angle around 1 mRad
  ✓ LER-X angle around 8.3 mRad
  ✓ LER-Y angle below -1.5 mRad

• Forward neutron counter 1 likes:
  ✓ HER-X angle below -17 mRad
  ✓ HER-Y angle above 2.5 mRad
  ✓ LER-X angle around 8.7 mRad
  ✓ LER-Y angle around -0.5 mRad

• Forward neutron counter 2 likes:
  ✓ HER-X angle above -16 mRad
  ✓ HER-Y angle around 1.8 mRad
  ✓ LER-X angle around 8.5 mRad
  ✓ LER-Y angle above 0 mRad
Summary (2/2)

- Nobody likes LER X-angle above 9.5 mRad!
  → Rough agreement for all variations vs LER X-angle

- DIRC scalers and backward neutron counters show similar evolutions

- HER X-scan: strong variations for forward neutron counter 2
- HER Y-scan: scalers and backward neutron counter dependance; strong variations for forward neutron counter 2
- LER X-scan: angles around 8-9 mRad favoured
- LER Y-scan: scaler + backward counter ~ anti-correlated with the forward neutron counters

- The 2 forward neutron counters seem similar variations for the LER scan but the HER-angles dependances are quite different

- Several 2004 parameterizations significantly off