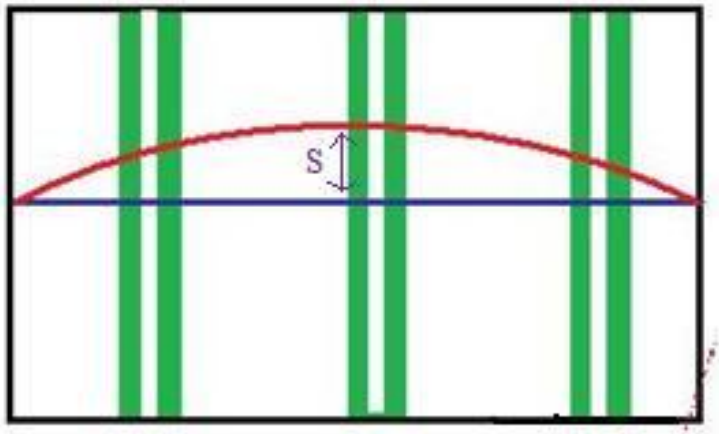
Gas Management of EE Chambers

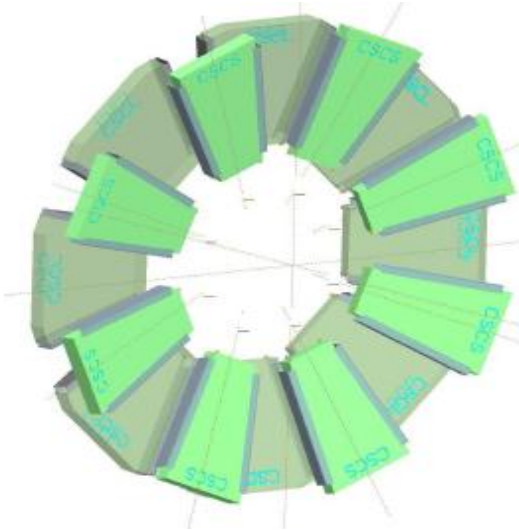
By: Eric Seabron

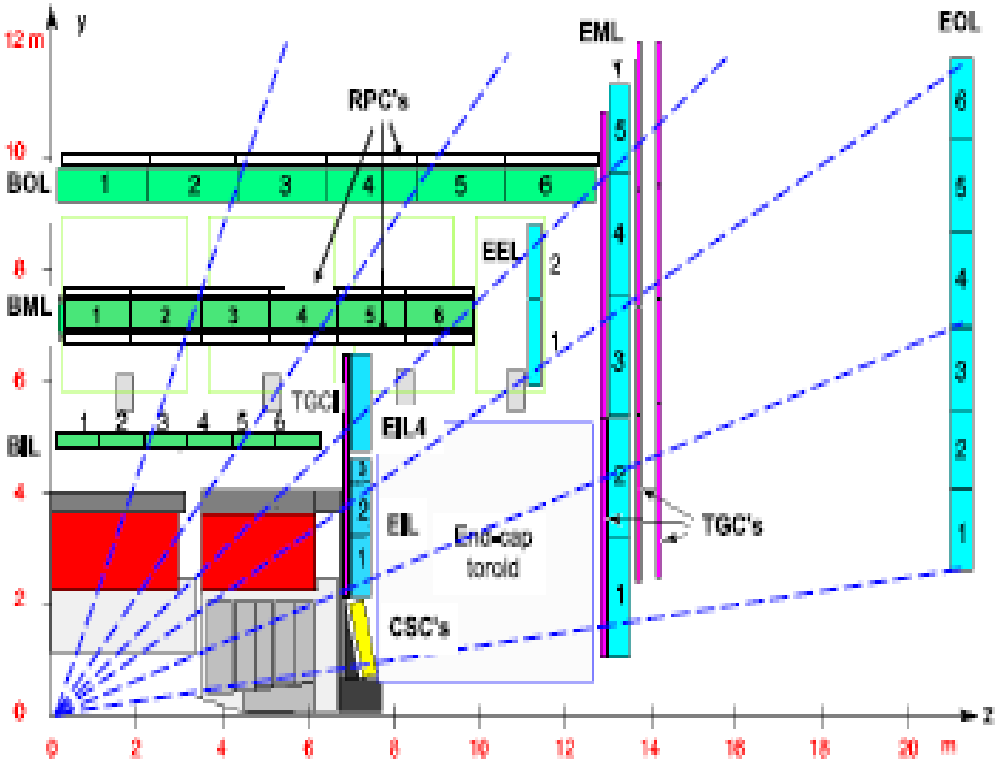


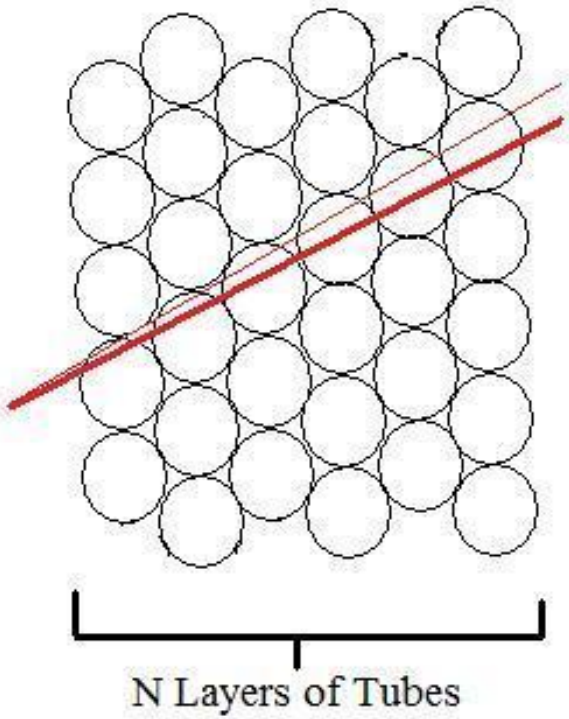
momentum, $p = \dfrac{eB(N \cdot k)^2}{8S}$

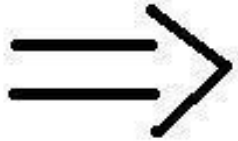
$$\eta = -\ln\left(\tan\frac{\theta}{2}\right)$$

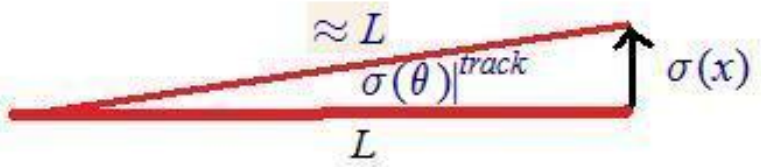
$$1.1 < \eta < 1.4$$











Notice that $\theta << 1 \Rightarrow \sigma(\theta) = \frac{\sigma(x)}{L}$

$$\sigma(\theta) = \frac{\sigma(z)}{L}\sqrt{\frac{(N-1)}{N(N+1)}}$$

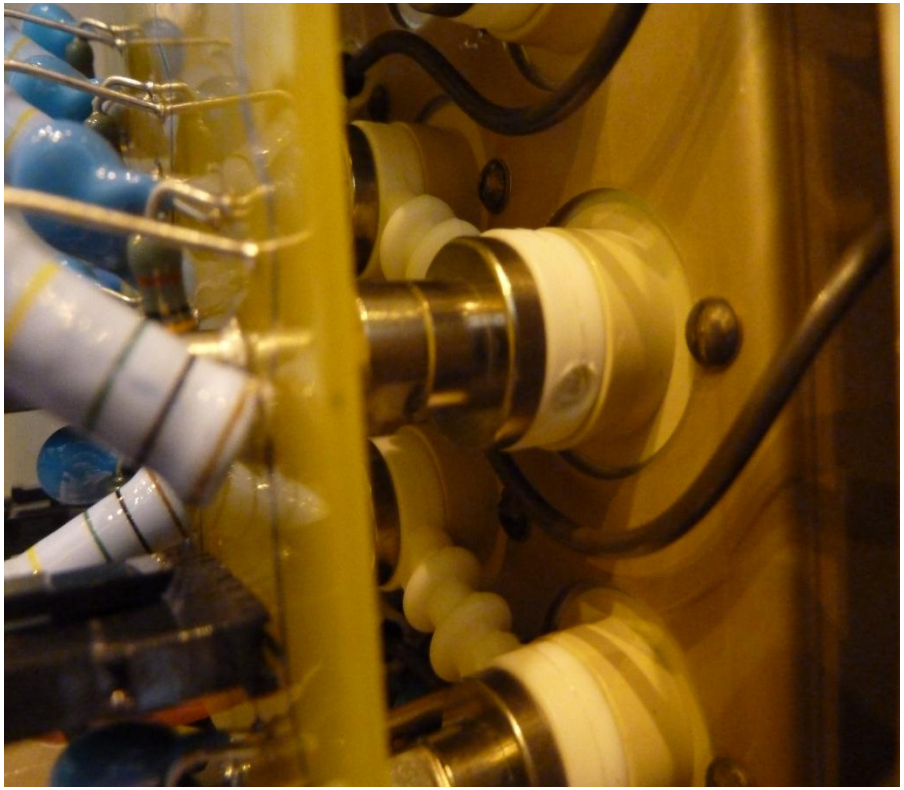
Thus $\sigma(x) = \sigma(z)\sqrt{\frac{(N-1)}{N(N+1)}}$, notice $\sigma(z) = (\text{resolution}) \times z$

The error in the Segitta, $\sigma(s) = \sigma(x)\sqrt{\frac{3}{2}}$

LEAKS = $ & Efficiency

⇓

~~LEAKS~~ ≡ < 2 mbar/day



For $N = 6$ and $\sigma(z) = 80\mu\text{m}$ we obtain:

$$\sigma(x) = (80\mu\text{m})\sqrt{\frac{5}{42}} \approx 27.603\mu\text{m}$$

$$\sigma(s) \approx 33.807\mu\text{m}.$$

For $N = 8$ and $\sigma(z) = 80\mu\text{m}$ we obtain:

$$\sigma(x) \approx 24.944\mu\text{m}$$

$$\sigma(s) \approx 30.432\mu\text{m}.$$

For $N = 5$

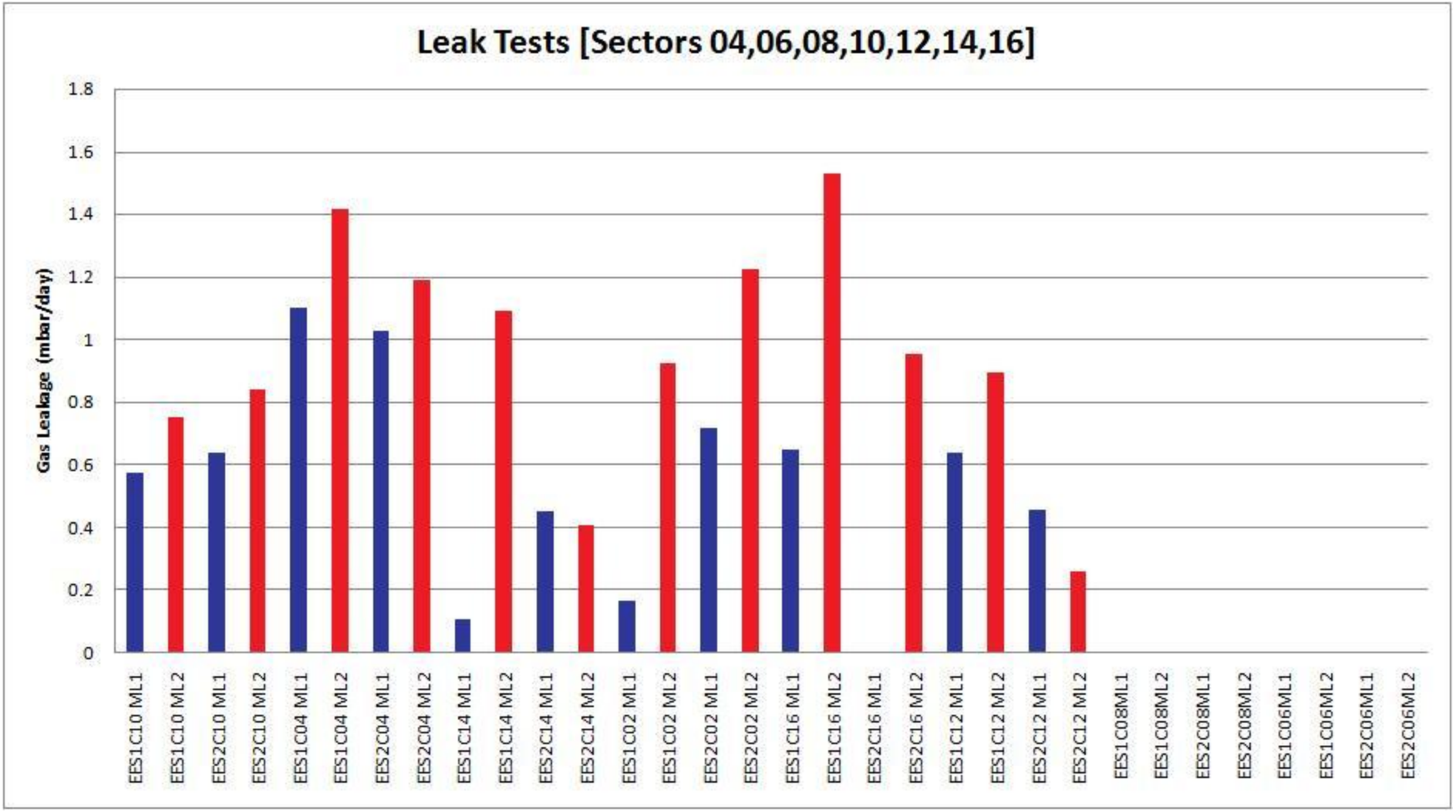
$$\sigma(x) \approx 29.212\mu\text{m}$$

$$\sigma(s) \approx 35.785\mu\text{m}$$

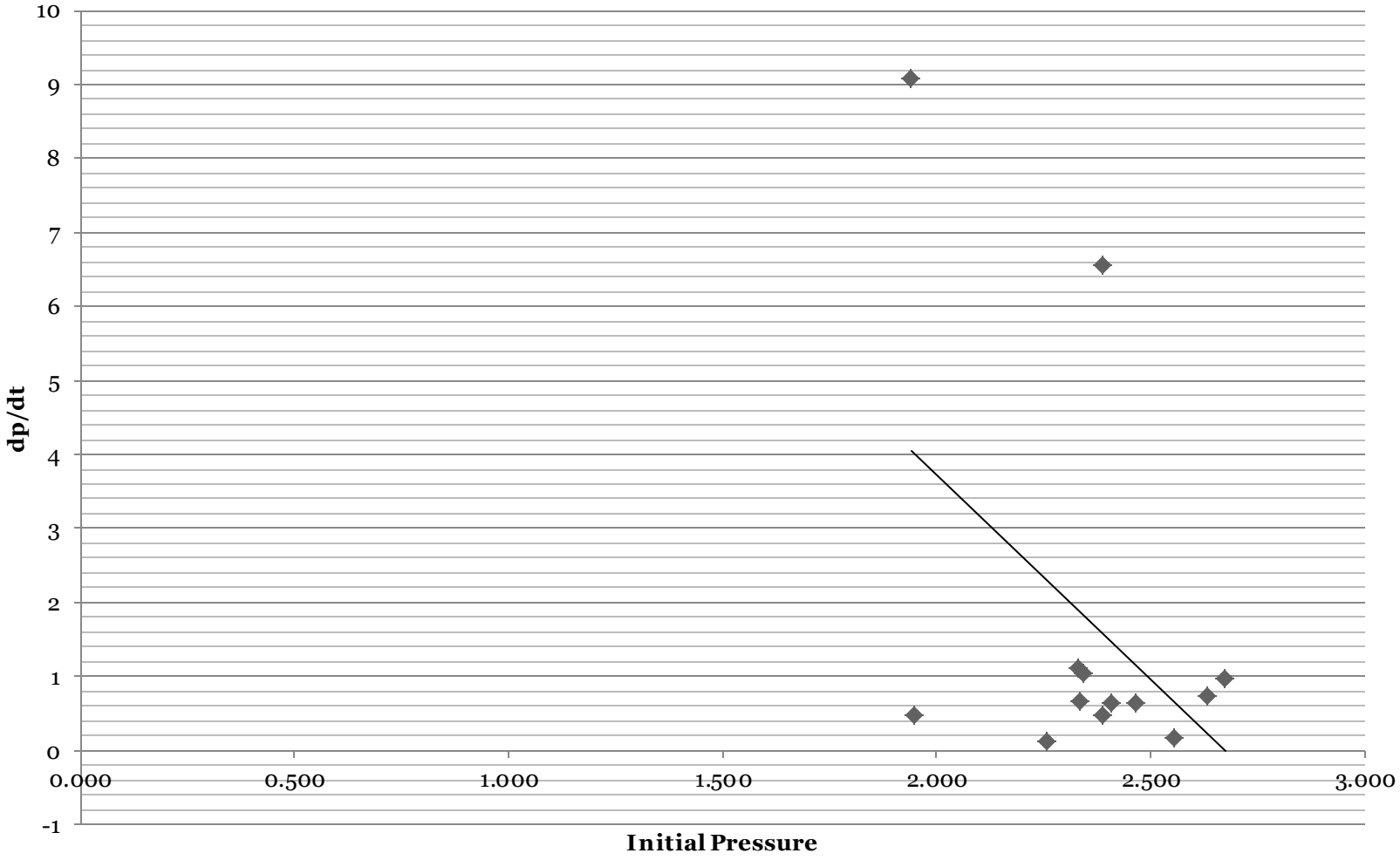
For $N = 3$

$$\sigma(x) \approx 32.66\mu\text{m}$$

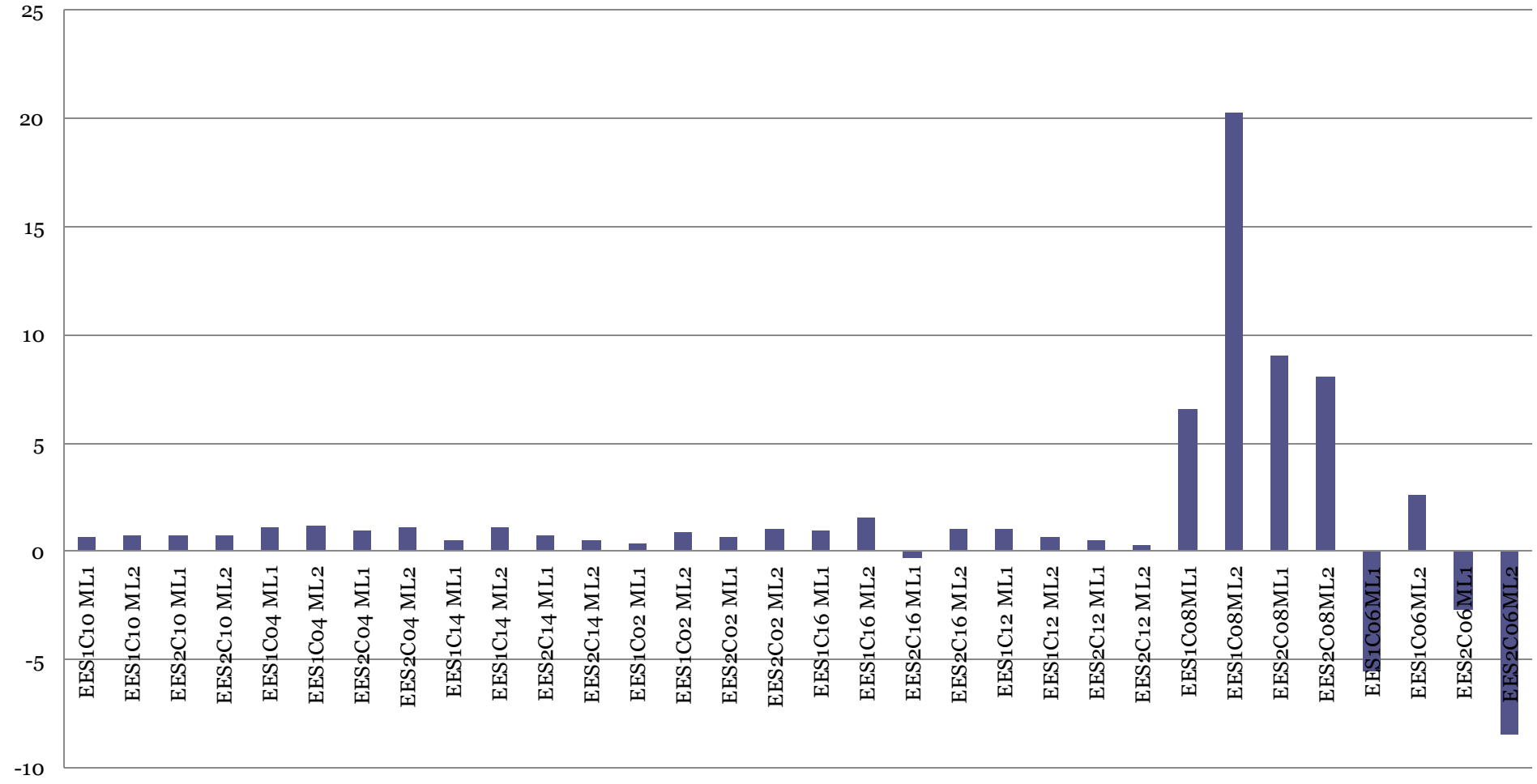
$$\sigma(s) \approx 40.01\mu\text{m}$$


Leak Tests [Sectors 04,06,08,10,12,14,16]
Gas Leakage (mbar/day)
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
EES1C10 ML1
EES1C10 ML2
EES2C10 ML1
EES2C10 ML2
EES1C04 ML1
EES1C04 ML2
EES2C04 ML1
EES2C04 ML2
EES1C14 ML1
EES1C14 ML2
EES2C14 ML1
EES2C14 ML2
EES1C02 ML1
EES1C02 ML2
EES2C02 ML1
EES2C02 ML2
EES1C16 ML1
EES1C16 ML2
EES2C16 ML1
EES2C16 ML2
EES1C12 ML1
EES1C12 ML2
EES2C12 ML1
EES2C12 ML2
EES1C08ML1
EES1C08ML2
EES2C08ML1
EES2C08ML2
EES1C06ML1
EES1C06ML2
EES2C06ML1
EES2C06ML2

Correlation Plot



Leakage Rate



Dedicated to Rex Brown
Greatly Missed