

E.5 Updated Berkeley systematics table

Below is my updated systematics table, as compiled on October 8, 2006, in immediate preparation for the unblinding of the DAQ clock frequency. I have conservatively enlarged some of the errors, but I have not changed any of the existing rates or corrections.

Stage	Source	Correction (ppm)	Error (ppm)
Pre-unblinding	Statistics	—	27.5
	Muon stop definition	—	2
	Muon scatter	9.9	2
	High- Z impurities	41.0	12
	Deuterium	19.5	2.5
	μp diffusion + scattering + impact cut	6.1	2
	Muon detector inefficiencies	—	2
	Electron detector inefficiencies	—	—
	Slop	—	2
Unblinding	Rescaling of error	—	< 1.1
Post-unblinding	DAQ clock stability (Agilent E4400)	—	1.4
	DAQ clock & beam structure beating	—	10
	Molecular formation ($\lambda_{pp\mu}$)	40	9
	Molecular transition (λ_{op})	10	5
	Total		...

Table 17: Revised tabulation of corrections and errors, statistical and systematic, for the total μ^- disappearance rate in hydrogen, $\lambda_{\text{Run8}}^{\text{unblinded}}$. Note that I have not included the errors on λ_0 and $\Delta\lambda_{\text{bound}}$, which will come into play when calculating Λ_S according to Equation 29. The numbers in the table are provided as ppm of $(\lambda_0 + \Lambda_S) \equiv (455,160 \text{ s}^{-1} + 688 \text{ s}^{-1}) = 455,848 \text{ s}^{-1}$. Thus, to convert from ppm to Hertz one must multiply by the factor $(455,848 \text{ s}^{-1}/(1 \times 10^6)) \approx 1/2$.

If we average my two results for cathode-AND and cathode-OR ,

$$\begin{aligned}
 \lambda_{\text{Run8}}^{\text{UCB}} &= (1/2)\text{cathode-AND} + (1/2)\text{cathode-OR} \\
 &= (1/2)455,393.33 \text{ s}^{-1} + (1/2)455,401.68 \text{ s}^{-1} \\
 &= 455,397.5 \text{ s}^{-1}
 \end{aligned}$$

then we should also add in roughly 3.8 Hz error to cover the two values. Doing this, and incorporating the new and/or revised errors in the systematics table gives

$\lambda_{\text{Run8}}^{\text{UCB}} = 455,397.5 \pm 15.0 \text{ s}^{-1} .$	(34)
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