τ-DECAY PARAMETERS

Neglecting radiative corrections and terms proportional to m_ℓ^2/m_τ^2, the energy spectrum of the charged decay lepton ℓ in the τ rest frame is given by

$$\begin{aligned}
&\frac{d^2\Gamma_{\tau\to\ell\nu\overline{\nu}}}{d\Omega\, dx} \propto x^2 \\
&\times\Bigg\{12(1-x) + \rho_\tau\left(\frac{32}{3}x - 8\right) + 24\eta_\tau\,\frac{m_\ell}{m_\tau}\,\frac{(1-x)}{x} \\
&-P_\tau\,\xi_\tau\cos\theta\left[4(1-x) + \delta_\tau\left(\frac{32}{3}x - 8\right)\right]\Bigg\}\ . \qquad (1)
\end{aligned}$$

Here $x = 2E_\ell/m_\tau$ is the scaled lepton energy, P_τ is the τ polarization, and θ is the angle between the τ spin and the lepton momentum. With unpolarized τ's or integrating over the full θ range, the spectrum depends only on ρ_τ and η_τ. Measurements of the other two Michel parameters, ξ_τ and δ_τ, require polarized τ's. Where possible, we give separately the parameters for $\tau^- \to e^-\nu_\tau\overline{\nu}_e$ and $\tau^- \to \mu^-\nu_\tau\overline{\nu}_\mu$, to avoid assumptions about universality.