

Window Functions: Mathematical Multiplication

The FID is Simply Multiplied by a Simple Mathematical Function to Give Weighting or Emphasis to Different Parts of the FID.

- Exponential Multiplier: A Decaying Exponential Function $e^{-(LB) t}$

The Parameter **LB** (Line Broadening) Adjusts How Quickly the Function Decays. The Result is Greater Signal-to-Noise Ratio in the Spectrum and Broader Peaks. The Optimal Value for LB is the Width of the NMR Peak at Half-Height Without any Window Used.

- 45 Degree Shifted Sine-Bell: A Sine Function Aligned with 45 Degrees at the Start of the FID and 180 Degrees at the End of the FID

The Result is Poorer Signal-to-Noise Ratio and Sharper (Narrower) Peaks in the Spectrum.

- 90 Degree Shifted Sine-Bell: A Sine Function Aligned with 90 Degrees (Maximum) at the Start of the FID and 180 Degrees at the End of the FID

The Result is a Smooth End to the FID, Eliminating the Wiggles in the Baseline Around the Peak. This is Very Important in Two-Dimensional (2D) NMR