

E Linear Mixed Model (LMM) Analysis

To evaluate the differences in network measures between **pre- and post-BIC conditions**, we employed an LMM framework using the `statsmodels` package in Python¹¹⁵. Each feature was modeled as a dependent variable, with the experimental condition (BIC00 or BIC10) as a fixed effect. To account for the dependency within the data, we included the window as a random effect, ensuring that repeated measures from the same unit were properly modeled.

Each network feature was tested separately using the following model:

$$\text{Measure} \sim \text{Condition} + (1|\text{Window}) \quad (2)$$

where *Condition* represents the pre- or post-drug state, and *Window* accounts for within-chip variability. Violin plots were generated to visualize the distribution of each network feature across conditions, and statistical significance was assessed using the LMM framework.