

S2 Appendix

Goodness of fit statistics

We report here the complete description of the fitting curves used in the main text to establish specific relationships between the fractional parameter α and four solution features of interest. The statistics used to evaluate the goodness of fit of each of the considered curves are:

1. the sum of squares due to error (SSE) measuring the total deviation of the response values from the fit to the response values

$$\text{SSE} = \sum_{i=1}^n (y_i - \hat{y}_i)^2;$$

2. the square of the correlation between the response values and the predicted response values (R-square)

$$\text{R-square} = 1 - \frac{\text{SSE}}{\text{SST}}, \quad \text{where} \quad \text{SST} = \sum_{i=1}^n (y_i - \bar{y})^2,$$

with SST representing the sum of squares about the mean;

3. the adjusted R-square based on the residual degrees of freedom, that is,

$$\text{adjusted R-square} = 1 - \frac{\text{SSE}(n-1)}{\text{SST}(k)},$$

where n is the number of response values and k is the number of residual degrees of freedom defined as $k = n - m$ with m equal to the number of fitted coefficients estimated from the response values;

4. the root mean squared error (RMSE) estimating the standard deviation of the random component in the data and defined as

$$\text{RMSE} = \sqrt{\frac{\text{SSE}}{k}}.$$

- Depolarization peak

Linear fit:

$$f(\alpha) = p_1 \alpha + p_2$$

Coefficients (with 95% confidence bounds):

$$\begin{aligned} p_1 &= 8.917 (8.819, 9.015) \\ p_2 &= -2.622 (-2.776, -2.468) \end{aligned}$$

Goodness of fit:

$$\begin{aligned} \text{SSE: } &0.01185 & \text{R-square: } &0.9998 \\ \text{Adjusted R-square: } &0.9998 & \text{RMSE: } &0.03848 \end{aligned}$$

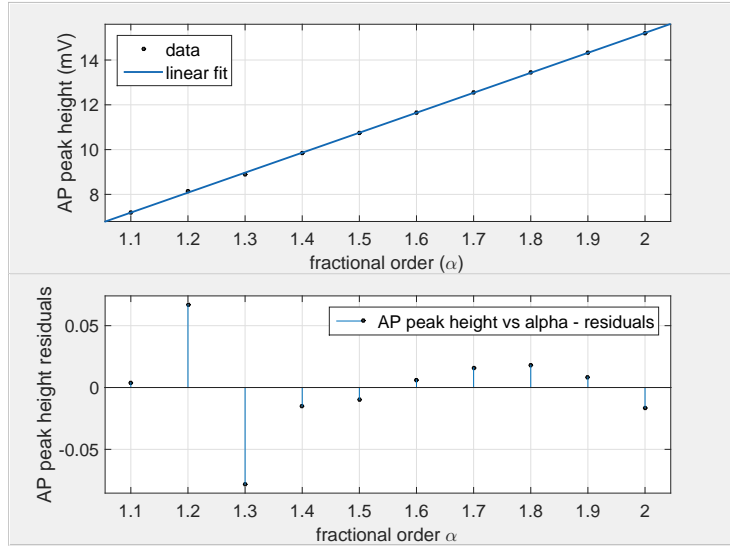


Figure 1: Curve fitting for the action potential peak height data and corresponding residuals.

- Action potential dome peak

Power law fit:

$$f(\alpha) = a\alpha^b + c$$

Coefficients (with 95% confidence bounds):

$$\begin{aligned} a &= -18.35 \text{ } (-18.75, -17.95) \\ b &= -5.037 \text{ } (-5.261, -4.813) \\ c &= 16.96 \text{ } (16.8, 17.12) \end{aligned}$$

Goodness of fit:

$$\begin{aligned} \text{SSE: } 0.03155 & & \text{R-square: } 0.9997 \\ \text{Adjusted R-square: } 0.9996 & & \text{RMSE: } 0.06713 \end{aligned}$$

- Early repolarization minimum

Power law fit:

$$f(\alpha) = a\alpha^b + c$$

Coefficients (with 95% confidence bounds):

$$\begin{aligned} a &= -47.51 \text{ } (-49.27, -45.75) \\ b &= -1.402 \text{ } (-1.504, -1.3) \\ c &= 24.37 \text{ } (22.34, 26.4) \end{aligned}$$

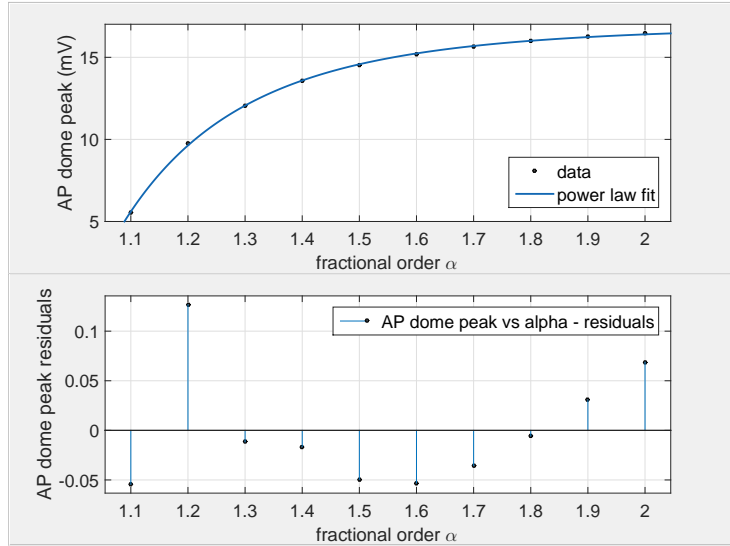


Figure 2: Curve fitting for the action potential dome peak data and corresponding residuals.

Goodness of fit:

SSE: 0.04996 R-square: 0.9999
Adjusted R-square: 0.9999 RMSE: 0.08448

- Conduction Velocity

Quadratic fit:

$$f(\alpha) = p_1\alpha^2 + p_2\alpha + p_3$$

Coefficients (with 95% confidence bounds):

$$\begin{aligned} p_1 &= 34.56 (34.06, 35.07) \\ p_2 &= -65.18 (-66.76, -63.61) \\ p_3 &= 32.34 (31.14, 33.53) \end{aligned}$$

Goodness of fit:

SSE: 0.01694 R-square: 1
Adjusted R-square: 1 RMSE: 0.04919

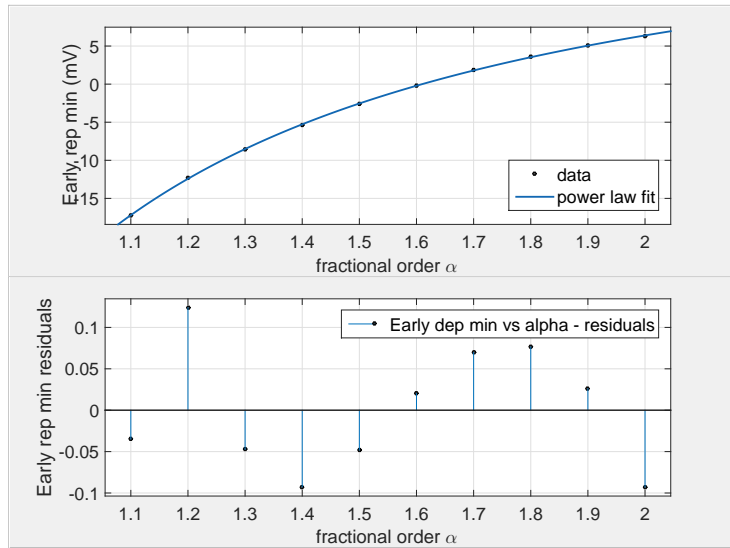


Figure 3: Curve fitting for the early repolarization minimum data and corresponding residuals.

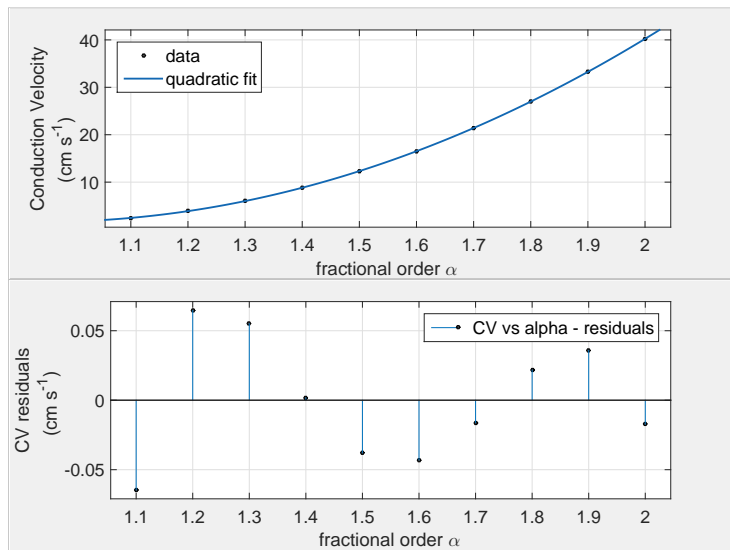


Figure 4: Curve fitting for the conduction velocity data and corresponding residuals.