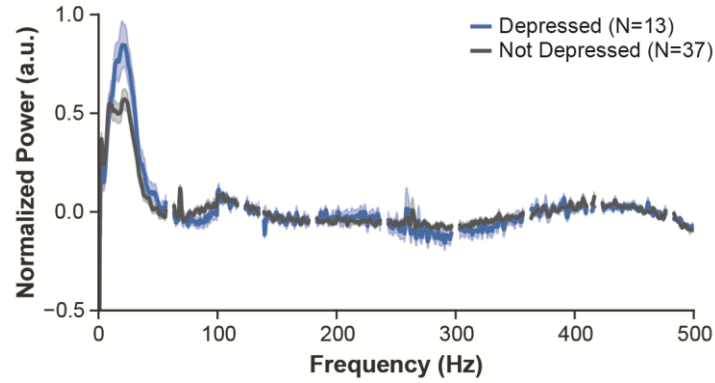




Supplementary Figure 1. Normalized power spectral density (PSD) for the depressed and not depressed groups over the full frequency range analyzed (1-500 Hz). Shaded limits denote standard error of the mean.

Supplementary Table 1: Generalized linear model (GLM) to assess the role of demographics, clinical, and neurophysiological variables in depression severity (BDI-II)

Variable	Coefficient (95% CI)	Standard Error	z	p-value
Intercept	10.03 (4.50-15.56)	2.82	3.55	<0.001*
Sex (Female=0, Male=1)	1.41 (-3.57-6.38)	2.54	0.56	0.58
Hemisphere (Left=0, Right=1)	4.01 (-0.49-8.50)	2.23	1.75	0.08
Antidepressant Use (No=0, Yes=1)	-1.71 (-6.49-3.07)	2.44	-0.70	0.48
Benzodiazepine Use (No=0, Yes=1)	-2.16 (-7.21-2.88)	2.58	-0.84	0.40
Non-Benzodiazepine Hypnotic Use (No=0, Yes=1)	0.49 (-3.79-4.77)	2.18	0.22	0.82
Preoperative Evaluation Time Point	1.24 (-0.98-3.46)	1.13	1.10	0.27
UPDRS-III (Off Levodopa)	0.77 (-2.59-4.13)	1.71	0.45	0.65
UPDRS-III (On Levodopa)	2.09 -1.11-5.30)	1.64	1.28	0.20
Age	-0.31 (-2.64-2.01)	1.19	-0.27	0.79
Disease Duration	0.22 (-2.11-2.54)	1.19	0.18	0.86
LEDD	1.98 (-0.59-4.56)	1.31	1.51	0.13
Apathy Scale Score	1.79 (-0.89-4.48)	1.37	1.31	0.19
STAI Trait Score	6.37 (3.70-9.04)	1.37	4.67	<0.001*
Average Delta Power	3.00 (-1.30-7.30)	2.19	1.37	0.17
Average Theta Power	0.98 (-3.73-5.69)	2.40	0.41	0.68
Average Alpha Power	-3.54 (-8.01-0.93)	2.28	-1.55	0.12
Average Beta Power	4.00 (0.23-7.78)	1.93	2.08	0.038*
Average Gamma Power	-1.87 (-4.89-1.16)	1.54	-1.21	0.23
Average HFO Power	1.73 (-0.57-4.03)	1.17	1.48	0.14
Average FOOOF Exponent (Slope)	0.61 (-5.29-6.50)	3.01	0.20	0.84
Average FOOOF Offset (Intercept)	-2.52 (-7.46-2.42)	2.52	-1.00	0.32