

The 1/f Landscape: Measured Spectral Exponents β Across Eleven Domains, from Vacuum Tubes to the Human Cortex

$S(f) \sim 1/f^\beta$; DFA and Hurst entries converted by $\beta = 2\alpha - 1$ only where the row says so; split values (a / b) are below / above a reported break

ELECTRONICS

vacuum tube (thermionic)	1.0
semiconductor (InSb film) voltage noise	1.0 (c)
homogeneous semiconductors (Hooge)	1.0 (c)
metal films (continuous; Bi)	1.0 (gamma 1.0-1.4)
metals (Dutta-Horn survey)	1.0 (range 0.8-1.4) (c)
graphene devices	1.0
MOSFETs (generic CMOS)	1.0 (c)
dc SQUID excess flux noise (mK)	0.6 (up to 0.9)
dc SQUIDs below 1 K	1.0 (c)
superconducting flux qubit flux noise	0.9

COND-MAT

spin glasses / mesoscopic conductors	1.0
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SINGLE-MOLECULE

nerve membrane resting potential	1.0
open maltoporin channel current	1.0
solid-state nanopore ionic current	1.0

NEURO

human ECoG broadband	2.44 (c)
human ECoG surface potential	2.01 / 4.0 (SD 0.18 / 0.13)
scalp EEG (awake rest)	1.33 (SD 0.2; range 1-2) (c)
MEG (awake rest)	1.06 (c)
fMRI BOLD gray matter	0.8 (range 0.5-1) (c)

PHYSIOLOGY

heart rate variability	1.0
heartbeat interbeat intervals (healthy)	1.0
heartbeat RR series	1.075 (c)
human gait stride intervals	0.83 (range 0.75-0.9) (u?)
postural sway (center of pressure)	1.0 (below 1 Hz) (c)

COGNITION

human RT / time-estimation series	1.0
human cognition RT (critique)	0.3 / 0.65

MUSIC

music & speech loudness	1.0 (c)
music/speech pitch	1.0
musical rhythm spectra (558 works)	0.5-1 (by subgenre/composer)

CLIMATE

surface temperature (short regime)	0.6 / 0.4 (tropics / high lat) (c)
surface temperature (long regime)	1.6 / 1.3 (tropics / high lat) (c)
daily land temperature anomalies	0.65

HYDROLOGY

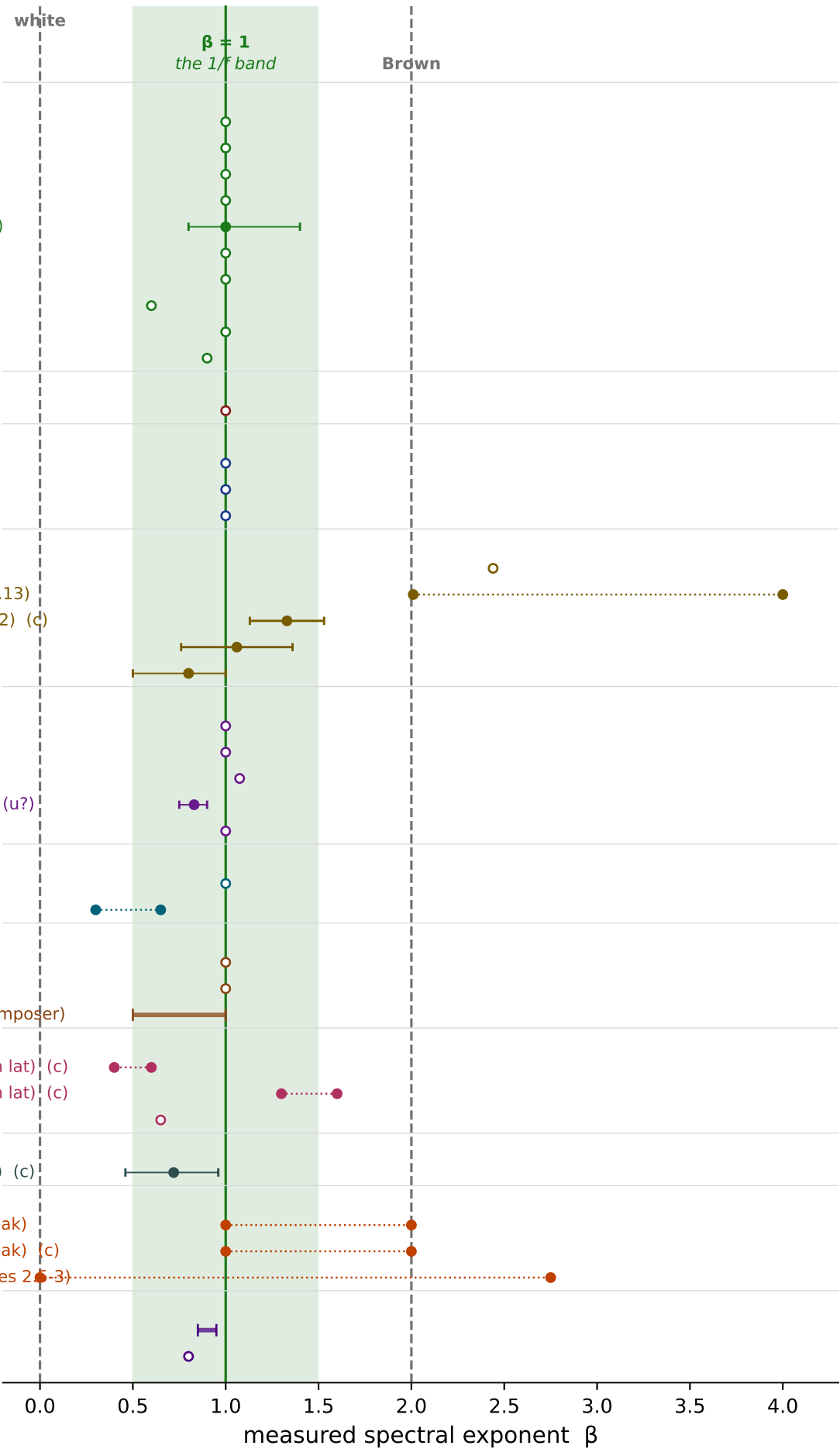
geophysical records, Hurst ensemble (690 series)	0.72 (range 0.46-0.96) (c)
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ASTRO

AGN X-ray variability (Seyferts)	1 / 2 (below/above break)
BH X-ray binaries (Cyg X-1)	1 / 2 (below/above break) (c)
quasar optical variability (DRW)	0 / 2.75 (HF bend slopes 2-3)

NETWORKS

Ethernet LAN traffic	0.85-0.95
wide-area internet traffic	0.8 (u?)



Not placeable on this axis (reported, not dropped): neural spectra aperiodic method [n/a]; rat/macaque LFP-ECoG E:I slope [n/a]; human ECoG knee-derived timescales [3-16 Hz]; human ECoG/EEG aging [flattens with age]; clinical resting EEG normative (n=532) [declines 0.003-0.004/yr]; EEG lifespan trajectories (large sample) [monotonic decrease]

(c) = compiled (u?) = unverified ◇ = exact