

The Fractality Landscape: Measured Dimensions Against the Exactly Known Values of Two-Dimensional Critical Geometry

exact SLE/CFT values as diamonds; embedding dimensions d = 1, 2, 3 as gray lines

EXACT

2D critical percolation cluster	1.8958 (exact 91/48)
2D percolation hull	1.75 (exact 7/4)
2D percolation external perimeter	1.3333 (exact 4/3)
2D self-avoiding walk	1.3333 (exact 4/3) (c)
planar Brownian frontier	1.3333 (exact (theorem))
DLA cluster (2D off-lattice)	1.71 ± 0.01
DLA cluster (3D)	2.5
KPZ interface (1+1d)	0.5 (exact) (c)

LAB

dielectric breakdown / Lichtenberg (2D lab)	1.7 (range 1.6-1.8)
fracture surfaces (large scales)	0.78 ± 0.05
fracture surfaces (small scales/quasistatic)	0.5
colloid aggregates DLCA	1.86 ± 0.05 (u?)
colloid aggregates RLCA	2.1 ± 0.05
turbulent/non-turbulent interfaces	2.4 (c)
turbulent energy dissipation field	2.87

FIELD

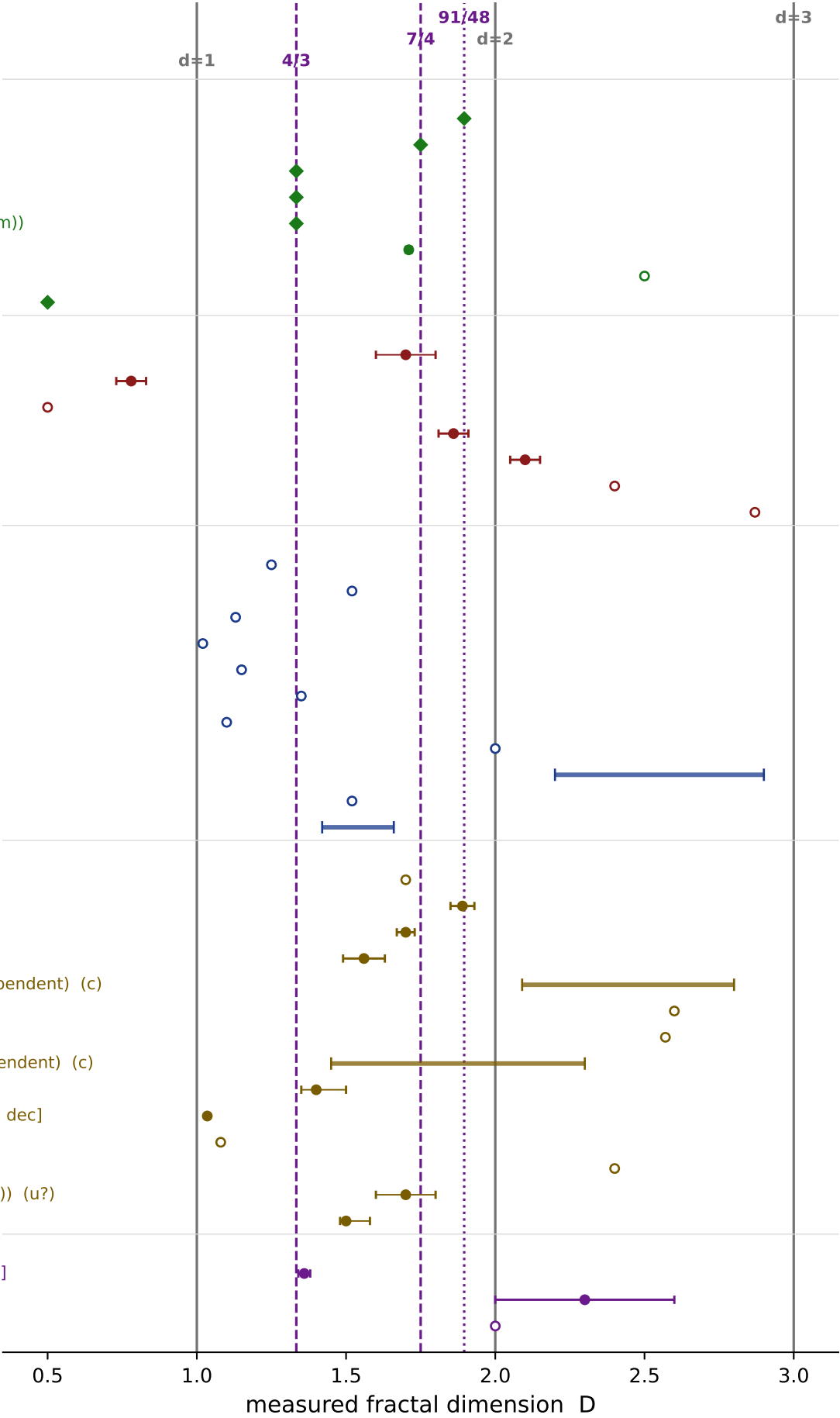
west coast of Britain	1.25
coast of Norway (fjords)	1.52 [~2 dec]
Australian coast	1.13
South Africa coast	1.02
Germany land frontier (1899)	1.15
cloud and rain areas (radar+satellite)	1.35
river channels (individual)	1.1 (c)
river drainage networks (entire)	2.0
soil pore-solid interface	2.2-2.9 (u?)
urban boundaries (US metros)	1.52 (average)
urban growth (Lisbon 1960-2004)	1.42→1.66

BIO

human retinal vasculature (normal)	1.7
tumor vasculature (mouse)	1.89 ± 0.04
normal arteries/veins (mouse)	1.70 ± 0.03
human bronchial tree	1.56 (SD 0.07)
human cerebral cortex (GM, MRI)	2.09-2.8 (methods-dependent) (c)
human cortical surface	2.6 (c)
human cerebellum	2.57 (c)
brain white matter surface	1.45-2.3 (method-dependent) (c)
neuron dendritic arbors (whole)	1.4 (range 1.35-1.5)
individual dendrites (single branches)	1.035 (1.03-1.04) [~1 dec]
human chromatin (Hi-C contact map)	1.08
protein surfaces (solvent-probed)	2.4
trabecular bone (radiographs/CT)	1.7 (range 1.6-1.8 (2D)) (u?)
plant root systems (2D images)	1.5 (1.48-1.58)

ASTRO

interstellar cloud boundaries	1.36 ± 0.02 [~2-4 dec]
interstellar clouds (mass-size)	2.3 ± 0.3
galaxy distribution (small scales)	2.0 [~1.5 dec]



Not placeable on this axis (reported, not dropped): Avnir survey: 96 Phys Rev fractal papers [1.3]; galaxy distribution transition to homogeneity [71] (c) = compiled (u?) = unverified ◇ = exact