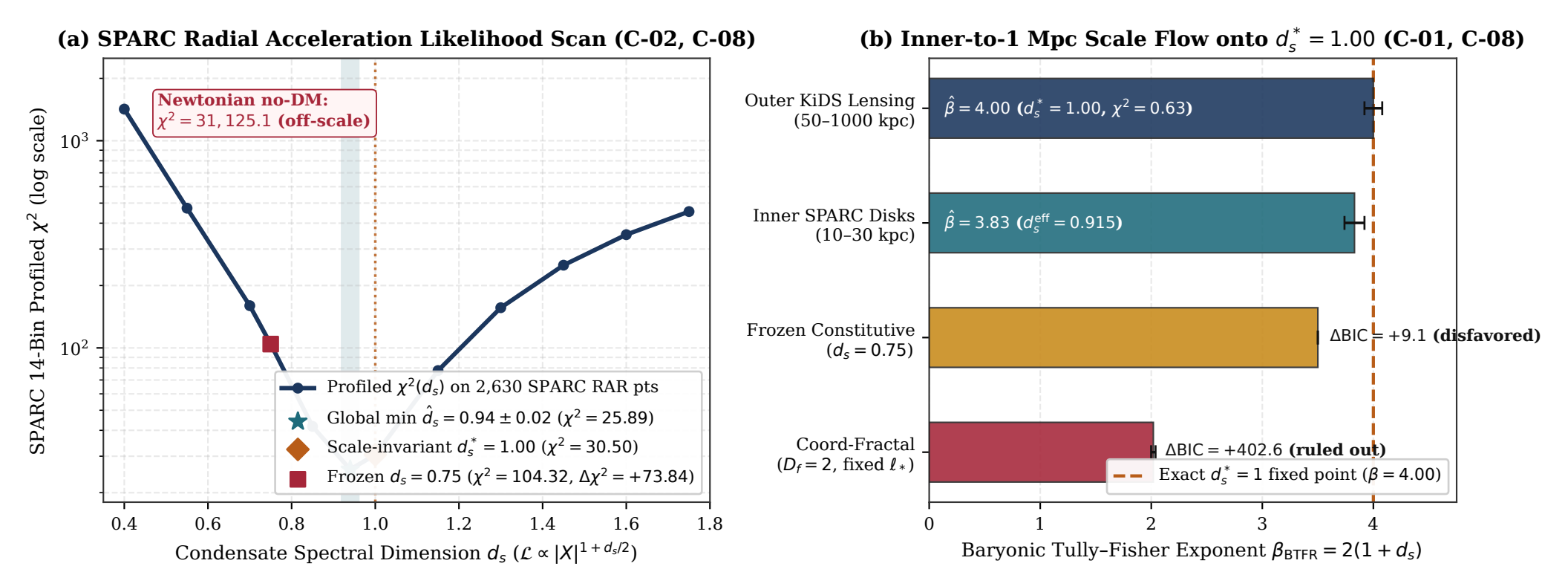

(a) SPARC Radial Acceleration Likelihood Scan (C-02, C-08)
Newtonian no-DM:
$\chi^2 = 31,125.1$ (off-scale)
10^3
10^2
SPARC 14-Bin Profiled χ^2 (log scale)
Profiled $\chi^2(d_s)$ on 2,630 SPARC RAR pts
Global min $\hat{d}_s = 0.94 \pm 0.02$ ($\chi^2 = 25.89$)
Scale-invariant $d_s^* = 1.00$ ($\chi^2 = 30.50$)
Frozen $d_s = 0.75$ ($\chi^2 = 104.32$, $\Delta\chi^2 = +73.84$)
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
Condensate Spectral Dimension d_s ($\mathcal{L} \propto |X|^{1+d_s/2}$)
(b) Inner-to-1 Mpc Scale Flow onto $d_s^* = 1.00$ (C-01, C-08)
Outer KiDS Lensing
(50–1000 kpc)
$\hat{\beta} = 4.00$ ($d_s^* = 1.00$, $\chi^2 = 0.63$)
Inner SPARC Disks
(10–30 kpc)
$\hat{\beta} = 3.83$ ($d_s^{\rm eff} = 0.915$)
Frozen Constitutive
($d_s = 0.75$)
ΔBIC = +9.1 (disfavored)
Coord-Fractal
($D_f = 2$, fixed ℓ_*)
ΔBIC = +402.6 (ruled out)
Exact $d_s^* = 1$ fixed point ($\beta = 4.00$)
0
1
2
3
4
Baryonic Tully–Fisher Exponent $\beta_{\rm BTFR} = 2(1 + d_s)$