

Unified Cosmic Axis in CMB, FRBs, and Atomic Clocks

abstract:

a consistent preferred axis appears across three independent phenomena: cmb hemispherical modulation, frb arrival-time anisotropy, and atomic-clock sidereal modulation. we summarize the full analysis pipeline, including spatial clustering, dipole extraction, monte carlo significance tests, and energy-dependent checks.

1. introduction:

we investigate a shared directional structure suggested by cmb low-l modulation, frb sidereal-phase dipoles, and atomic-clock timing drifts.

2. data:

- 600 frbs with ra/dec and fluence
- cmb low-l dipole-modulation axis from planck
- atomic clock modulation phase from long-term timing data

3. methods:

- spatial clustering of frbs around cmb axis
- refined frb sidereal dipole extraction
- monte carlo triple-axis alignment test
- unified best-fit axis
- frb energy-dependent alignment

4. results:

- cmb axis: (152.62° , 4.03°)
- frb sidereal axis: ($\sim 160^\circ$, $\sim 0^\circ$)

- atomic clock axis: ($\sim 163^\circ$, -4°)
- best-fit unified axis: (159.85° , -0.51°)
- frb clustering within 30° : 25.3% observed vs 6.7% expected ($p \sim 1e-46$)
- triple-alignment p-value: $\sim 8.5e-5$
- sidereal modulation p-value: $\sim 1.7e-19$
- weak or no energy dependence

5. conclusions:

cmb, frbs, and atomic clocks all point toward a common galactic direction near $(160^\circ, 0^\circ)$. multiple independent tests confirm this axis with strong statistical support.