

Technical Memo — Cosmic-String Lensing Starter (Rubin-style)

Purpose. Provide a lightweight, public, and reproducible artifact that demonstrates feasibility of a cosmic-string lensing search: simulation → pair-finding → colinearity scoring → null-result G_μ limit. This memo describes module roles and how they map to Rubin/RSP components (Butler, Qserv, Portal/Firefly, forced photometry, RAIL). **Modules.** • *sim_string.py*: injects undistorted duplicate sources along a straight “string”. • *pair_finder.py*: naive peak detector + flux-matched pair selector with a toy colinearity idea. • *stats_limit.py*: Poisson-based 95% CL upper limit on G_μ given survey area and completeness. **Rubin mapping.** Replace file I/O with *Butler* dataset handles; prefilter candidates using *Qserv* catalog queries; perform *forced photometry* via LSST tasks; compute photo- z PDFs with *RAIL*. QA/triage in the RSP *Portal (Firefly)*. **Public Pilot Data.** HSC-SSP PDR3, DES DR2, and Legacy Surveys (DR9/DR10) cutouts provide immediate tests with no data-rights issues.