

Siril Guide CAFALD v1.0

CAFALD currently operates **ONLY** on raw, uncalibrated light frames (**light.fit**).

It must **NOT** be applied to **pp_light.fit** or any preprocessed/calibrated output.

Applying calibration (darks, flats, bias) **before** CAFALD destroys the CFA photosite structure CAFALD relies on.

We are actively working on a **separate CFA-domain calibration path**, but this is **not yet part of the standard workflow**.

What CAFALD Works On (Today)

- ✓ Raw CFA light frames (**light.fit**)
- X Preprocessed lights (**pp_light.fit**)
- X Debayered images
- X Any image that has undergone interpolation or resampling

CAFALD must see the **original Bayer mosaic exactly as captured by the sensor**.

Recommended Siril Workflow (Current / Stable)

1 Normal RGB Calibration (Standard Siril Workflow)

Process your colour data exactly as you normally would:

1. Load RAW lights, darks, flats, bias
2. Run Siril preprocessing
3. Register and stack
4. Debayer → RGB
5. This produces your **fully calibrated RGB image**

This RGB stack is used **only for colour**.

2 CFALD Luminance Extraction (Separate Path)

This is a **parallel workflow**, not a replacement.

1. Load **raw light.fit** frames only
2. Do **NOT** preprocess
3. Do **NOT** apply offsets, flats, or darks
4. Apply CFALD to each raw light frame
5. Register the CFALD frames
6. Stack with **drizzle enabled**

Result:

- ✓ High-SNR CFA-domain luminance
 - ✓ No demosaic noise
 - ✓ Spatial detail reconstructed by registration + drizzle
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3 Combine CFALD Luminance with RGB

Use CFALD output exactly like a mono luminance:

- CFALD stack → **L**
- Siril RGB stack → **RGB**

Final step:

L + RGB → LRGB combination

You now have:

- Mono-like depth from CFALD
 - Full-resolution colour from calibrated RGB
 - Both extracted from the **same OSC data**
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Why Calibration Is Currently Excluded

Calibration frames:

- Resample pixels
- Mix CFA photosites
- Break the one-photosite = one-sample assumption

CFALD depends on:

One spatial location sampled multiple times through the CFA

Once calibration touches the data, that assumption is no longer true.

Work in Progress (Important Note)

🚧 CFA-domain calibration for CFALD is under active development

We are experimenting with:

- CFA-aware dark subtraction
- CFA-preserving flat correction
- Channel-separated calibration strategies

Until this is complete and validated:

Calibration must be applied only to RGB, not CFALD

CFALD is applied only to raw light frames (`light.fit`) and is used as a luminance layer combined with a normally calibrated RGB stack.