

SHO met 2 filters

This pair can produce a convincing three-channel narrowband image with an OSC camera, with one important caveat: the two filters are quite different around OIII. The SV220 passes H α and OIII at about 7 nm FWHM, whereas the Askar C2 is roughly 15 nm around SII and 35 nm around OIII. That makes the SV220 OIII cleaner, especially under light pollution, so I would normally use the **SV220 as the primary H α + OIII source and the C2 primarily as the SII source**. [Svbony](#)

1. What each OSC exposure contains

With a typical RGGGB OSC sensor, the useful approximation is:

Filter	Red pixels	Green/blue pixels	Best use
SV220 H α /OIII 7 nm	mostly Hα	mostly OIII	H α + primary OIII
Askar C2 OIII/SII	mostly SII	mostly OIII	SII + optional supplemental OIII

The separation works because H α at 656.3 nm and SII near 672 nm mainly excite the red Bayer pixels, while OIII at 500.7 nm is recorded strongly by green and, to a lesser extent depending on the sensor, blue pixels. The SV220 specifically has 7 nm bands at 500.7 and 656.3 nm. [Svbony](#)

The C2 is considerably broader: approximately **15 $\pm$ 3 nm at SII and 35 $\pm$ 5 nm at OIII**, with >90% peak transmission. [David Astro](#) That wide OIII window means more background and potentially H β /continuum contribution, which is why I wouldn't automatically average the two filters' OIII data 50/50.

2. Exposure lengths

There is no universal correct subexposure; focal ratio, camera read noise, gain, light pollution, and target brightness matter more than the filter name. For a modern cooled CMOS OSC such as an IMX533/571/2600-class camera at roughly f/4–f/6, these are sensible starting points:

Dataset	Dark/moderate skies	Bright suburban skies	Suggested total
SV220 H α /OIII	180–300 s	180–300 s	4–8+ h
C2 SII/OIII	300–600 s	180–300 s if background rises quickly	6–12+ h

I would aim for roughly **1.5–2 $\times$ as much total C2 integration as SV220 integration** if SII is important. SII is often substantially weaker than H α , and users of this general combination report needing considerably more C2 time. [app.astrobin.com](#)

For example, a good first project might be:

SV220: 100 $\times$ 240 s = 6 h 40 min

C2: 100 $\times$ 360 s = 10 h

Don't increase individual exposure merely because SII is weak. Once your sky background is comfortably above read noise, **more subs/total integration is preferable to simply making every sub very long**. Check that bright stars and the brightest nebular cores aren't saturating.

One other equipment consideration: SVBONY states that the SV220 7 nm filter is **not recommended below f/4**, because fast optical systems can shift the narrow passbands.

[Svbony](#)

3. Best targets

This technique is fundamentally for **emission-line objects**, not broadband targets. Good candidates include supernova remnants, planetary nebulae, Wolf-Rayet shells and large HII regions. SVBONY similarly recommends the SV220 for emission nebulae, planetary nebulae and supernova remnants. [Svbony](#)

Particularly good pseudo-SHO targets are **M16 Eagle, M17 Omega, NGC 7000 North America, IC 1805 Heart, IC 1848 Soul, NGC 7380 Wizard, NGC 7635 Bubble, NGC 6888 Crescent, IC 443 Jellyfish and the Rosette.**

Targets with appreciable SII structure are especially rewarding. On a nearly pure H α target, your SII channel can look like a weaker copy of H α , so adding C2 data may produce less dramatic additional structure than expected. Recent OSC users have reported exactly that sort of result on some targets. [Reddit](#)

Galaxies, reflection nebulae, globular clusters and dark nebulae are generally poor choices for this workflow.

4. Calibrate and stack the filters separately

Do **not** mix all the SV220 and C2 lights into one stack.

Create two independent calibrated integrations:

HO_master = all SV220 frames

SO_master = all C2 frames

Use flats appropriate to each filter. If changing filters changes focus appreciably, refocus when switching.

Ideally, keep both sessions at the same rotation/framing. Dithering is strongly recommended.

After integration, choose one master—usually the SV220 master—as the registration reference and geometrically register the C2 master to it. PixInsight's StarAlignment, APP's registration, Siril's registration, etc. work well.

5. Extract the three monochrome channels

For a straightforward OSC workflow, split each registered RGB master into R, G and B.

From the SV220:

H α $\approx$ R(SV220)

and initially:

OIII $\approx$ average[G(SV220), B(SV220)]

or, in PixelMath terminology:

$OIII = (G_HO + B_HO)/2$

Exactly how much weight to give green versus blue depends on your camera's spectral response. Many OSC cameras have substantially stronger green response at 500.7 nm, so an empirically optimized combination such as:

$$\text{OIII} = 0.7 * \text{G_HO} + 0.3 * \text{B_HO}$$

can outperform a simple average. Don't regard those coefficients as universal.

From the C2:

$$\text{SII} \approx \text{R}(\text{C2})$$

and optionally:

$$\text{OIII_C2} = (\text{G_C2} + \text{B_C2})/2$$

This gives you three principal masters:

$$\text{S} = \text{R_C2}$$

$$\text{H} = \text{R_SV220}$$

$$\text{O} = (\text{G_SV220} + \text{B_SV220})/2$$

That's the cleanest starting point.

6. Should you combine the two OIII datasets?

You can, but normalize them first.

Because the C2's OIII window is ~35 nm versus 7 nm for the SV220, the two OIII masters will have different background levels, star profiles and amounts of continuum contamination. [David Astro](#)

So I would first compare:

A — cleanest

$$\text{O} = \text{OIII_SV220}$$

B — deeper, if the C2 data is good

$$\text{O} = 0.7 * \text{OIII_SV220} + 0.3 * \text{OIII_C2_normalized}$$

C — signal-dependent

Use the SV220 OIII for nebular structure and add C2 OIII only where it improves S/N.

Before B or C, match the C2 OIII intensity distribution/background to the SV220 OIII using something such as LinearFit, NarrowbandNormalization or an equivalent normalization step.

There are real examples of imagers combining SV220 H α /OIII with Askar C2 SII/OIII successfully, so the pairing is practical rather than merely theoretical. [Reddit](#)

7. Build a literal Hubble Palette

The standard SHO/Hubble mapping is:

SII → Red

Hα → Green

OIII → Blue

So after linear processing and normalization:

$R = S$

$G = H$

$B = O$

This is a genuine **SHO channel assignment**, even though the signals were obtained with dual-band OSC filters rather than three mono filters.

Initially it will probably look overwhelmingly green because Hα is normally much stronger than SII and OIII. That's normal.

Do not simply force the three channels to equal brightness at capture time. Normalize them during processing instead.

8. Getting the familiar gold/blue Hubble look

Straight SHO often gives green nebulae. The familiar gold/cyan/blue appearance comes mainly from nonlinear color manipulation after combination.

A good sequence is:

1. Background extraction on H, S and O separately.
2. Denoise while linear.
3. Register precisely.
4. Normalize channel intensity.
5. Combine S/H/O → R/G/B.
6. Stretch.
7. Reduce excess green.
8. Adjust hue so Hα/SII regions migrate toward gold/orange.
9. Preserve OIII-dominated regions as cyan/blue.
10. Apply local contrast/detail enhancement.

If using **PixInsight**, **Curves**, **SCNR** in moderation, ColorMask-based adjustments, NarrowbandNormalization, or one of the SHO/Foraxx scripts can make this much easier.

9. A useful pseudo-SHO alternative

I often prefer a less literal mapping with OSC data because it avoids the intense green of straight SHO.

For example:

$R = S$

$$G = 0.65 * H + 0.35 * O$$

$$B = O$$

Or:

$$R = 0.8 * S + 0.2 * H$$

$$G = 0.75 * H + 0.25 * O$$

$$B = O$$

Those aren't scientifically literal colors—they are aesthetic mappings of genuine narrowband data—but they often give a pleasing gold/blue appearance more readily.

Another excellent choice is a **Foraxx-style SHO** blend, which tends to separate H α /SII structures into warm hues while retaining OIII as blue/cyan and suppressing the characteristic all-green appearance of raw SHO.

10. One improvement specific to your filter combination

Because the **SV220 has a substantially narrower OIII band than the C2**, I would structure acquisition priorities like this:

Highest priority: enough SV220 time to get clean H α **and** clean OIII.

Next priority: lots of C2 integration to make the weaker SII red-channel extraction smooth.

Optional: use the C2's OIII only as additional signal after normalization.

That avoids allowing the C2's broad OIII passband to determine the quality of your oxygen channel. One experienced discussion of essentially this exact SV220 + C2 combination similarly notes the concern about the very different passbands. [Cloudy Nights](#)

If you tell me which processing software you use—**PixInsight, Siril, AstroPixelProcessor, Photoshop/Affinity, or something else**—I can give you the exact step-by-step extraction and channel-combination workflow, including the PixelMath/Siril formulas.

pixinsight

For PixInsight, this is the cleanest workflow for your SV220 + Askar C2 OSC data.

1. Calibrate and integrate each filter separately

Process the SV220 lights as one dataset and the C2 lights as another. WBPP is ideal.

You should end up with:

- SV220_master
- C2_master

Register the C2 master to the SV220 master with **StarAlignment** if WBPP did not already produce geometrically matched integrations.

2. Split both masters into RGB

Use **ChannelExtraction** in RGB mode.

From SV220_master, you get:

- SV220_R → mostly H α
- SV220_G
- SV220_B

From C2_master, you get:

- C2_R → mostly SII
- C2_G
- C2_B

Rename them immediately so the workflow stays clear.

3. Create the narrowband masters

Use **PixelMath**.

For H α :

SV220_R

Call the result H α .

For SII:

C2_R

Call the result SII.

For OIII, start with the SV220 only:

$0.7 \cdot \text{SV220_G} + 0.3 \cdot \text{SV220_B}$

Call that OIII.

A simple equal-weight version also works:

$(\text{SV220_G} + \text{SV220_B})/2$

For many modern OSC sensors, I would test both and keep whichever gives the best S/N and least ugly star structure.

4. Optional: add the C2 OIII signal

Build a second oxygen image:

$0.7 \cdot \text{C2_G} + 0.3 \cdot \text{C2_B}$

Call it OIII_C2.

Before combining it with the SV220 oxygen data, use **LinearFit** or another normalization method so the two OIII masters are on comparable intensity scales.

Then try:

$0.75 \cdot \text{OIII} + 0.25 \cdot \text{OIII_C2}$

I would not start at 50/50 because the C2 oxygen band is much broader and may carry more continuum/background.

5. Process H α , OIII and SII while still linear

Treat the three synthetic monochrome channels much like mono narrowband data.

A solid sequence is:

1. **DynamicCrop**, identically on all channels if needed.
2. **GradientCorrection** or DBE.
3. **BlurXTerminator**, if you use it.
4. **NoiseXTerminator**, if you use it.
5. Optional mild linear contrast work.
6. Normalize channel levels before combination.

For gradient removal, don't force identical DBE samples if the gradients are different between filter sessions. What matters is that the final images remain registered.

6. Normalize the channels

H α will usually dominate badly.

You can use **LinearFit**, often choosing H α or OIII as the reference, but be cautious: simple LinearFit can sometimes over-amplify a very weak SII channel.

A better approach is often to visually compare the channels with STF and make modest PixelMath scaling adjustments.

For example:

SII*1.4

H α

OIII*1.15

Those numbers are only examples. The correct multipliers depend heavily on the target.

The goal is not to make the three channels scientifically equal. You're trying to stop H α from completely overwhelming the color composite.

7. Make the basic SHO image

Open **ChannelCombination**, choose RGB, and assign:

R = SII

G = H α

B = OIII

That is standard SHO / Hubble mapping.

The first result will usually look very green. That's expected.

8. Stretch

I prefer stretching after channel combination, especially if your three linear channels are already well controlled.

You can use:

- **GHS**
- **HistogramTransformation**
- **MaskedStretch**

GHS is particularly good for preserving bright nebular structure while bringing out faint OIII and SII.

9. Remove the excessive green

This is where the recognizable Hubble look starts to appear.

A simple method is **SCNR**, but don't automatically remove 100% green. Try something around 40–70%.

Too much SCNR can flatten useful color differences.

You can also use Curves instead, which gives you more control.

10. Shift toward gold and blue

Use **CurvesTransformation**.

The usual goal is:

- H α /SII regions → yellow, gold, orange
- OIII-rich regions → cyan or blue
- mixed zones → intermediate colors

The **Hue** curve is especially useful.

You can also make masks with **ColorMask** and adjust gold and blue regions independently.

A common workflow is:

SHO combine

→ stretch

→ mild SCNR

→ Curves hue adjustment

→ saturation increase

→ local contrast

11. A better-looking pseudo-SHO PixelMath mix

Instead of literal SHO, try this directly in PixelMath with "Create new image" and RGB enabled:

Red:

SII

Green:

$0.65 * \text{Ha} + 0.35 * \text{OIII}$

Blue:

OIII

That typically gives a less violently green starting point.

Another useful blend is:

Red:

$0.8 * \text{SII} + 0.2 * \text{Ha}$

Green:

$0.75 * \text{Ha} + 0.25 * \text{OIII}$

Blue:

OIII

This is no longer a literal channel-for-channel SHO mapping, but aesthetically it often works better with OSC-derived narrowband data.

12. If you use Foraxx

For this filter pair, a Foraxx-style blend is often an excellent choice because it handles the typical weakness of SII and the dominance of Ha better than plain SHO.

A practical approach is:

- generate clean Ha
- generate clean SII
- use the SV220-derived OIII
- feed those three monochrome masters into your preferred Foraxx PixelMath formula/script

The result generally gives you stronger gold/copper separation in Ha/SII structures and cleaner blue/cyan oxygen regions with less manual hue surgery.

13. Star handling

This setup can produce distracting magenta, cyan, or oddly colored stars because each narrowband channel records stellar continuum differently.

For the best-looking result, make a starless SHO image first using **StarXTerminator**.

Then either:

- process the narrowband stars separately and reduce saturation, or

- replace them with RGB/broadband stars if you have separate RGB data.

That often improves the image more than any other color tweak.

My recommended PixInsight recipe

For your exact filter combination, I would use:

Ha = SV220_R

SII = C2_R

OIII = $0.7 \cdot \text{SV220_G} + 0.3 \cdot \text{SV220_B}$

Then optionally deepen oxygen with:

OIII_final =

$0.75 \cdot \text{OIII} + 0.25 \cdot \text{OIII_C2_normalized}$

Then build:

R = SII

G = Ha

B = OIII_final

and follow with star removal, stretch, mild SCNR, Curves, and local contrast.