Measurements for HH 7-11: extinguished line plus continuum at four wavelengths. Label wavelengths 1-4: 0.656, 1.26, 1.28, 1.64 microns, and call the measurements (pixel values, fluxes) .

Take as priors: zero-reddening flux ratios 

Assume that

1. the extinction is all foreground, and described by the Draine and Weingartner calculations. The extinction factor is of the form , where
2. the scattered light continuum is characterized by a single blackbody temperature *T,* that we can determine by fitting to non-line emitting regions. It will be a pretty low temperature as there’s no continuum evident in the Hα image.

**TASK 1:** Determine a good value for *T* by fitting to to the fluxes of the continuum filament by HH 8.

Then for each pixel we have four equations in four unknowns: the extinction-corrected fluxes and  of the longer-wavelength [Fe II] and H I lines; the extinction , and the scale factor *C* that multiplies the blackbody function for the continuum:

**TASK 2:** Write code for solving the nonlinear four equation/four unknown system.

**TASK 3:** Use the code to generate images in ; that is, extinction-corrected [Fe II]1.64 and Paβ.

**Bonus TASK (added by Adam this time for curiosity…) …** but what if we changed the continuum formulation:

This is solvable because we have 4 unknowns if we assume Av can be solved for based on the FeII ratio! (or just parameterizing everything in terms of Av and leaving that as our free parameter).

Let’s try this out…move Av to the LHS and treat y^Av as some constant or input for a given pixel

With that, we have an exact solution for fH! With fH solved for, we can solve for C130. With C130 solved for, we can solve for fFe. With fFe, we can lastly solve for C167. That looks like:

Now here we could make Av as a free parameter and do a fit for the system numerically. Or we can work out Av separately and see what we get out. We can try this both ways.

From graphical inspections, it appears we can simplify this further by saying f2 is independent of C, T:

Now we need to plug in fFe…

But if f2 is independent of temperature…

If we use this **with a numerical fit to C(T),** we will have constrained Av(f), C(T). Then we’ll still need fH and fFe…except we actually have fFe from stating

So lastly fH…again, if we have C and Av, along with f3, we can just solve

**Given the independent variable (T), then we just need to satisfy C (and fFe, fH) such that we get back f3 and f4 correctly…**