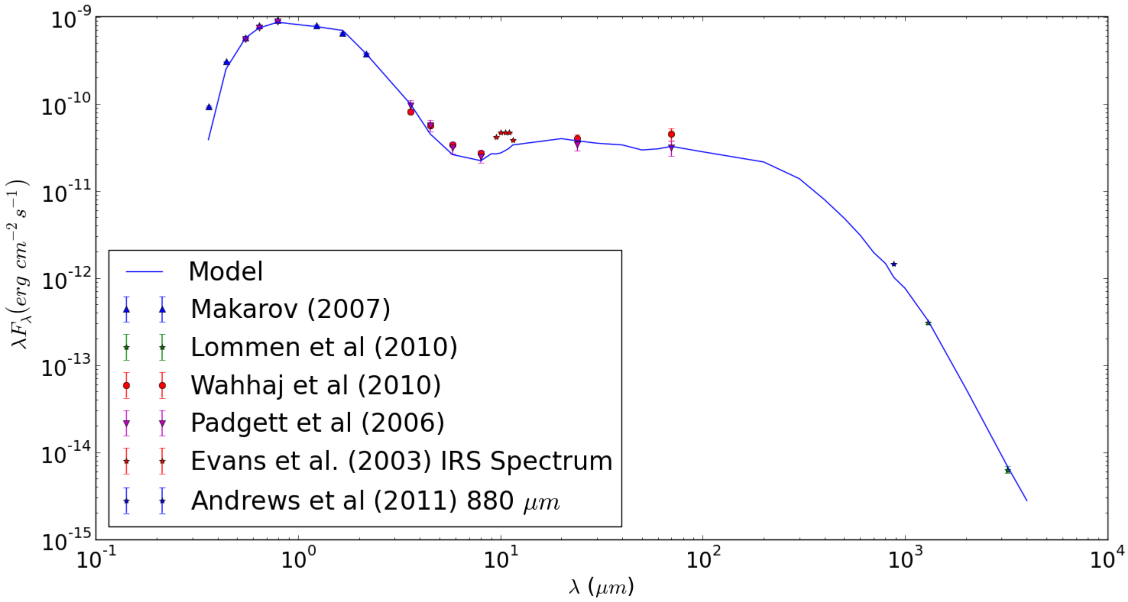

Figure 4.2: SED for the single-zone disk model. The parameters are given in Table 4.4. The different markers denote the photometric points from different references. The fluxes from Table 4.1 have been de-reddened in this plot. The large difference in the two data points at 70 μm comes from the different data reduction pipelines used by Padgett et al. [39] and Wahhaj et al. [38].

4.2.3 More Zones, More Parameters

Andrews et al. [23] suggested a more complicated model. This consists of an inner disk, an outer disk and a gap in between the two. Their surface density follows the tapered edge profile (Equation 4.4), but in the inner regions they supress the surface density to allow for a low density cavity that represents the dip in intensity in their submm data (see Figure 2.1). So within the cavity $\Sigma(\mathrm{R} \leq R_{cav}) = \delta_{cav}\Sigma(R)$ with $\log\delta_{cav} = -5.8$.
Then they introduce a "wall" on the inside of the outer disk. This is a narrow ($\Delta R = 0.1$ AU) region where they locally increased the scale height. Because at the edge of the disk, a lot of material is directly exposed the stellar radiation field, heating up that region and causing it to be puffed up [47].
Furthermore, they allow for dust settling [48], where the larger dust grains "sink" down towards the midplane. They mimick this effect by creating two separate density distributions for the outer disk, one for small grains and one with a decreased scale height for larger grains (see Table 4.5). Then they put 85% of the mass in the large grains and the remaining 15% into the small ones. To clarify the structure of this model, we show a sketch of it in Figure 4.3.