

This is NPRs compilation, and current understanding of, the emails and discussions that went back in forth first in late July, and then moreover around the 10th August and the first week in September.

The basic picture is outlined below and given in Figure 1.

1. We start with an inflated disk, with non-zero torque at the ISCO, and $h/R \sim 0.2$ inside of $R \sim 100R_g$. This is the initial state in circa 2000.
2. ‘Something’ happens, around 2007, to provoke a switch to a zero torque at ISCO state.

There are two basic scenarios to this ‘something’: First, this could be likely due to going from a nonzero torque (NZT) condition at the inner boundary of the disk to a zero torque (ZT) condition. This could be triggered by a B -field collapse, contraction or ejection close to the BH. Alternatively, using the “Lamppost model” of AGN coronae, the lamppost is being raised so there is less heating of the inner disk and the cooling front propagates outwards.

3. A cooling front is set-up, which propagates out from the ISCO at the timescale, t_{front} . Regions behind the front emit flux at 0.1 of what they did prior to the passage of the front (due to drop in T ? $T \downarrow \times 1.78 \Rightarrow L \downarrow \times 10$), and the temperature decrease leads the height to drop by a factor of 2 (just due to less kinetic energy??). L_{ion} starts dropping due to the drop in ionizing photons, which in turn causes the H-lines to also start to drop.
4. Because the disk starts fat, the cooling front time is not that long, and by 2010 (3 years later), the front has reached $R \sim 50R_g$. During that time, the collapsing disk height increases the number density of scatterers, which in turn causes Rayleigh scattering producing the blue downturn in the 2010 spectrum.
5. The cooling front keeps going, until it hits the part of the disk where it is normally thin, around $R = 100R_g$, arriving around 2012. This sets up another (heating) front, which will travel *back in* towards the SMBH, and re-inflate the disk. This ‘returning’ front travels more slowly because the disk is thinner. It also means the return to normal will be asymmetric in time, as observed, and the g -band bottoms out first because that is coming from $R \sim 100R_g$.
6. We expect the front to return to the ISCO in about 2018. That means the H lines will come back a few months later, but the WISE IR flux shouldn’t come back until about 2021.

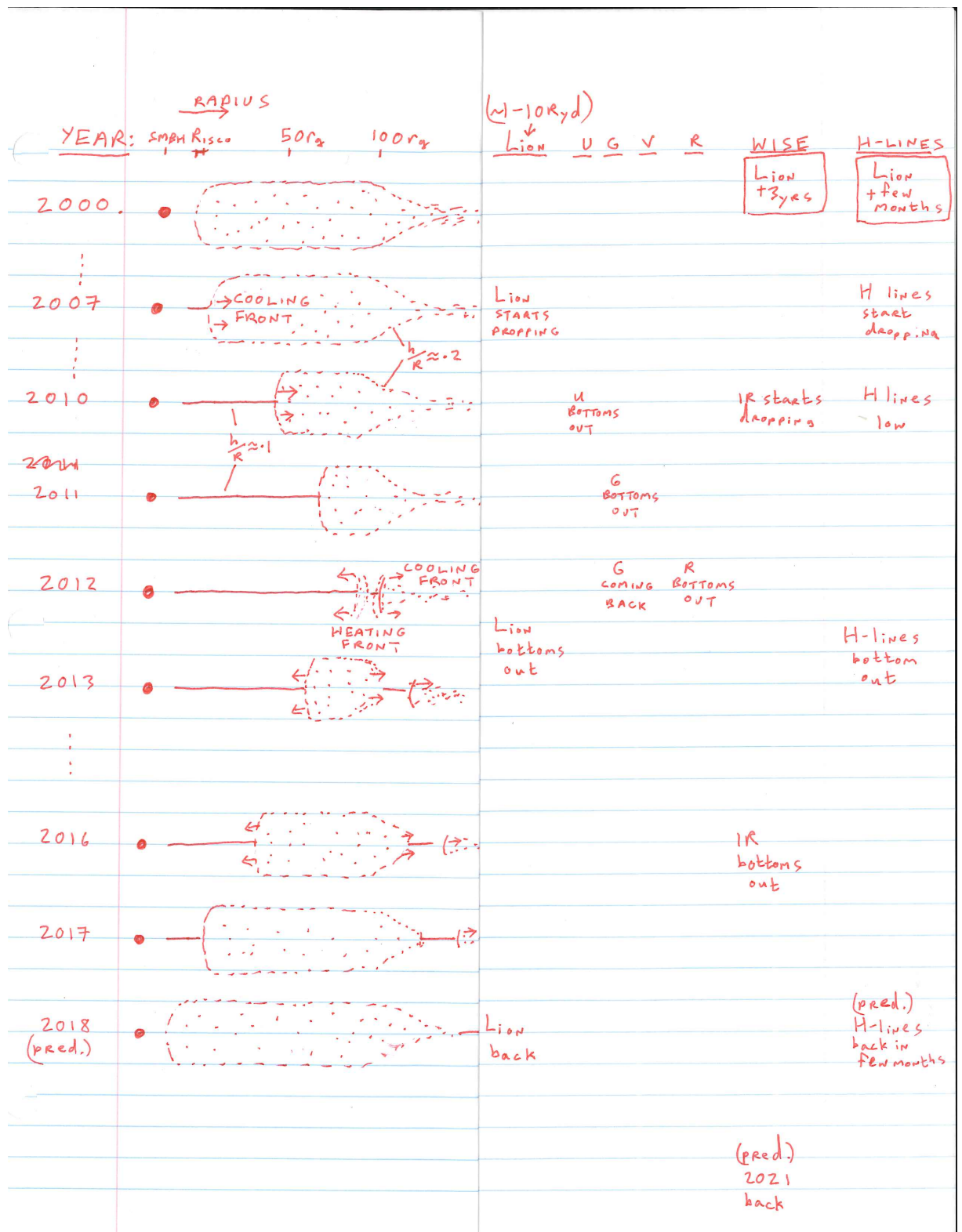


Figure 1: Our working model explaining the optical and IR light-curves, the change seen in the 3 spectra, and making predictions to what will be seen in 2018 and 2021.