
Minutes Day 2: Nov 17, 2021: Session 4: Community-led session: AGN, TVS microlensing, and Strong Lensing: together we stand!

Blazar studies and quasar accretion disk sizes measurements are two key intersections between these three collaborations.

Timo Anguita-Strong Lensing in general:

- seeing in first year important for grav.lenses; - suggest to follow one of the optimised seeing strategies for the first year- in order to find the lenses as soon as possible, which is important for future monitoring of these objects;

Colin Burke-accretion disks:

-uncovers a relationship between the mass of actively feeding SMBHs and the characteristic timescale in the light flickering pattern; -these results are compared with accreting white dwarfs — and found that the same timescale-mass relation holds,-there is an even more exciting application of these results. Now that there is a correlation between the flickering pattern and the mass of the central accreting object, we can use it to predict what the flickering signal from an Intermediate mass BH might look like; -mining the LSST dataset to search for flickering patterns that are consistent with accreting IMBHs has the potential to discover and fully understand this long sought mysterious population of black holes; - pitch for having at least some Rubin light curves sampled with time-scales of few hours in order to probe the accretion physics; - need couple of nights with hourly cadence to get characterization of light curves, which could be later probed even with poorer cadence;- Simons Foundation article on Burke's work <https://www.simonsfoundation.org/2021/08/12/black-holes-flicker-when-they-eat-revealing-their-size/>

Claudia Raitieri-Blazars:

-article just accepted for APJS Special Issue on LSST;- showing analysis of LSST observing strategies from perspective of blazars;- for WDF, support 2x15s do mitigate saturation of flaring blazars;- for DDF, advocate for intranight observations;- have different filters in the same nights to obtain colors;- extension of the WFD to the north favored;

Timo Anguita-microlensing:

- lensed quasar time-delays and microlensing;- study the structure of AGN accretion disks; - microlensing - scales on years to decades, thus LSST is perfect; - rolling cadence will lose a fraction of microlensing events;

Zhefu Yu-accretion disks:

- quasar accretion disk sizes from continuum reverberation mapping in the DES Standard star and SNe fields; -construct continuum light curves with the griz photometry that span five seasons of DES observations with a cadence as short as 1 day;- derive time lags between bands and fit for accretion disk sizes ; - include disks around black holes with masses as small as $\sim 10^7 M_{\text{sun}}$, which have equivalent sizes as small as ~ 0.1 light day in the rest frame; -find that most objects have accretion disk sizes consistent with the prediction of the standard thin-disk model when disk variability is taken into account; - have also simulated the expected yield of accretion disk measurements under various observational scenarios for the Large Synoptic Survey Telescope Deep Drilling Fields;- find that the number of disk measurements would increase significantly if the default cadence is changed from 3 days to 2/ 1 day;

APPENDIX

Discussion:

Zeljko Ivezić: the fact that y axis in the left panel doesn't start at zero makes it look like a much more dramatic change!

Timo Anguita:

On the number of "golden lenses" compared to baseline?

Sure! to be fair then: Rolling cadences give us about 10% less lensed candidates than baseline. And also to be fair, any increase in area of WFD linearly increases the number of lensed quasars of course not candidates, "golden lenses"

Niel Brandt: How long period of 1-2day cadence is required? And how sensitive are your calculations to weather loses?

Zhefu Yu:

- We have not particularly addressed weather loses.
- We have uniform cadence for the whole session, i.e. 6 months or more;

Niel Brandt: Can you save that and get good lag recovery for shorter period?

Zhefu Yu: That can be tested.
