

with Alastair Bruce, Chelsea MacLeod, Suvi Gezari, Martin Elvis, Martin Ward and the Harvard and Belfast transient pipeline teams

and the whole PS1 team





Transient selection :

SN exclusion

LT/WHT followup

CRTS for some

 $\Delta m>1.5$ in g/r/i within 0.5" of SDSS galaxy colour, light curve

64 AGN; +20 likely AGN multiple epochs for some

decade long light curves for some

WHT spectra

normal-ish AGN at z~1

but EW(MgII) weak by ~ factor two on average

in at least a few cases...

CIII/CIV track continuum

MgII/H β constant or slower

spectral light curves

but some more complicated!

Tidal Disruption Events?

unlikely

total flare energy 50 times too large

timescale years c.f. months

expected viscous timescale $\sim 10^4$ years

duty cycle bizarrely small

possibly some kind of "disc dump" event?

for 10^8 Msun, dynamical timescale is ~ 5 years at 1000 Rs

dust cloud eclipsing central source at SDSS epoch? timescale of ~years for cloud at ~pc distances

but weak lines suggest low state is the normal state and no obvious colour trend during recent monitoring

foreground microlensing

for $z_s=1 \ z_l=0.25 \ m_l=1m_{sun}$

Amplitude = x10

transverse v=300 km/s for u=0.1

 $\theta_{\rm E}=2.91\mu as$

 $u=\theta/\theta_E=0.1$

 $t_E=37$ years $t_{1/2}=7$ years

at source plane

r_E=28 light days

==> accretion disc usually point source BLR partially resolved

potential to map BLR

foreground features?

J142232

QSO z=1.08 absn z=0.86

foreground features?

J104556 QSO z=0.99 absn z=0.63

foreground features?

J103837

QSO z=0.62 absn z=0.18

