| 8/5/2015 |

$RA, Dec \longleftrightarrow x, y$

PANSTARRS - 2010 - 2014 → 30 for each.
4 pos - for 4 years

POSS-I
II
SDSS
PANSTARRS.

for each

RA 1, 2, 3, 4

Calculate Median

$\overline{RA} = MED(RA)$

$\Delta RA_i = \overline{RA} - RA_i$ Residuals.

Do this for every galaxy. ΔR_i^k

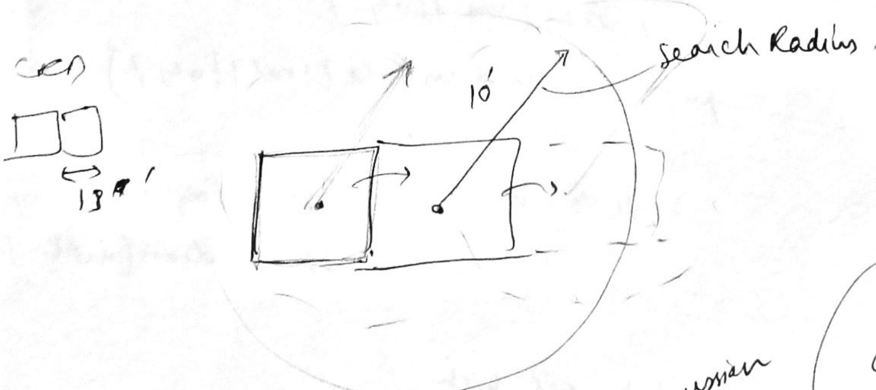
i = years
k = galaxy.

for all galaxy for every year

$\overline{\Delta RA_i} = Med(\Delta RA_i)$

→ $RA^k_{New\,i} = RA^k_i - \overline{\Delta RA_i}$

$\overline{RA}^k_{New} = MED(RA^k_{New\,i})$



uncertainty ∵ photon noise ①

$RA_{obs} = RA_{True} + \delta RA + ②$

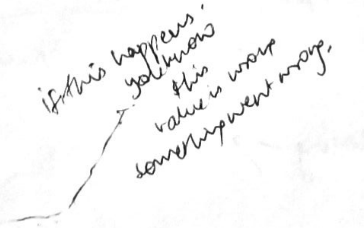
typically ~ 20 mas

Counting - Poisson Noise $\propto \sqrt{N}$

reduce to

100. Gal ⇒ 2 mas

photon Noise

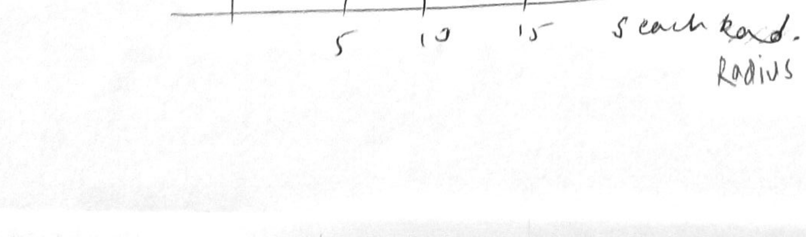


③ Systematic. $\Delta \overline{R_i}$

④ ∈ outlier

instead of std dev

Robust $RMS = 0.741\,(Percentile(Arr, 75) - Per(Ar, 25))$



chose 10' coz it gives ~100 galaxies.