

Fast Switching

- Almost no work since ALMA Memos 403 & 404 came out 18 months ago.
- Fast switching \rightarrow very quickly detects the atmospheric phase on a nearby calibrator, then applies that phase to the target source, cycle time $<$ atmospheric stab. time
- Advantage: Well defined method to calculate residual phase errors.
- Complication: For SNR & Source Count reasons, we calibrate @ 90 GHz
 - Basically, must make electronics stable - • multi- γ electronic phase cal every 15-30 minutes
 - Must understand sub-mm dispersion.
 - If there are dry fluctuations - will work for mm won't work for sub-mm (dispersion)

(2)

- In our most recent fast switching analysis, we optimized between:
 - Maximizing the time on source to minimize SNR Loss
 - minimizing the cycle time to minimize decorrelation SNR Loss
- ~~Results~~ We matched the best phase conditions to the highest γ —
Note significant sensitivity loss compared to matching the best γ conditions
 \Rightarrow WVR's advantage!
- Results in:
 - 20 s cycle time
 - 2-3 s slewing & calibrating
 - calibrator - typically 50 mJy,
 - < 1 degree ~~0.5 deg~~
 - ~~0.5 deg~~ $\sim 10-15\%$ sensitivity loss relative to no fast switching through no atmosphere.

★ Decorelation Correction

★ Evaluate Prototype antennas'
Fast Switching & Settle ~~Di~~ Down function