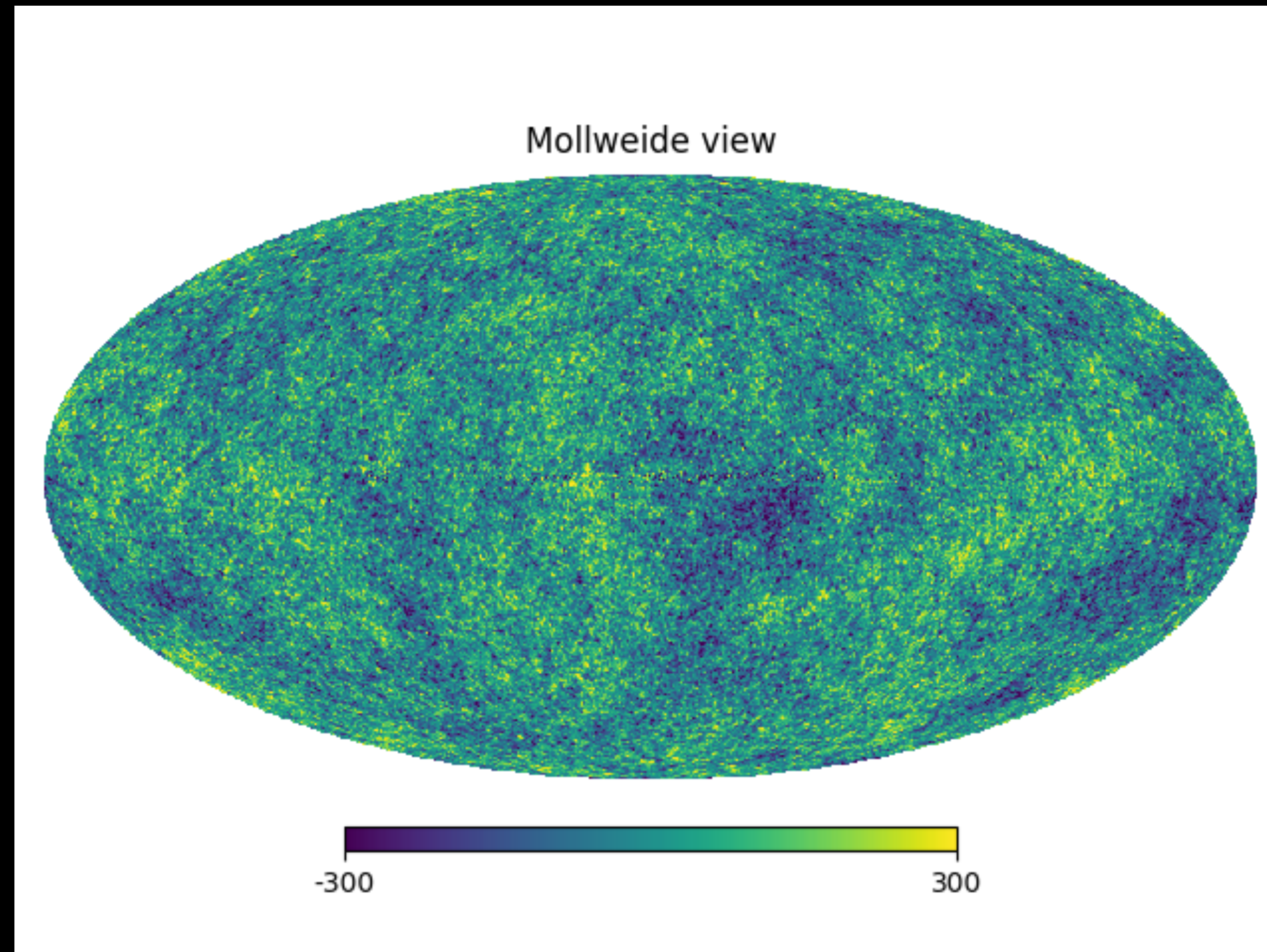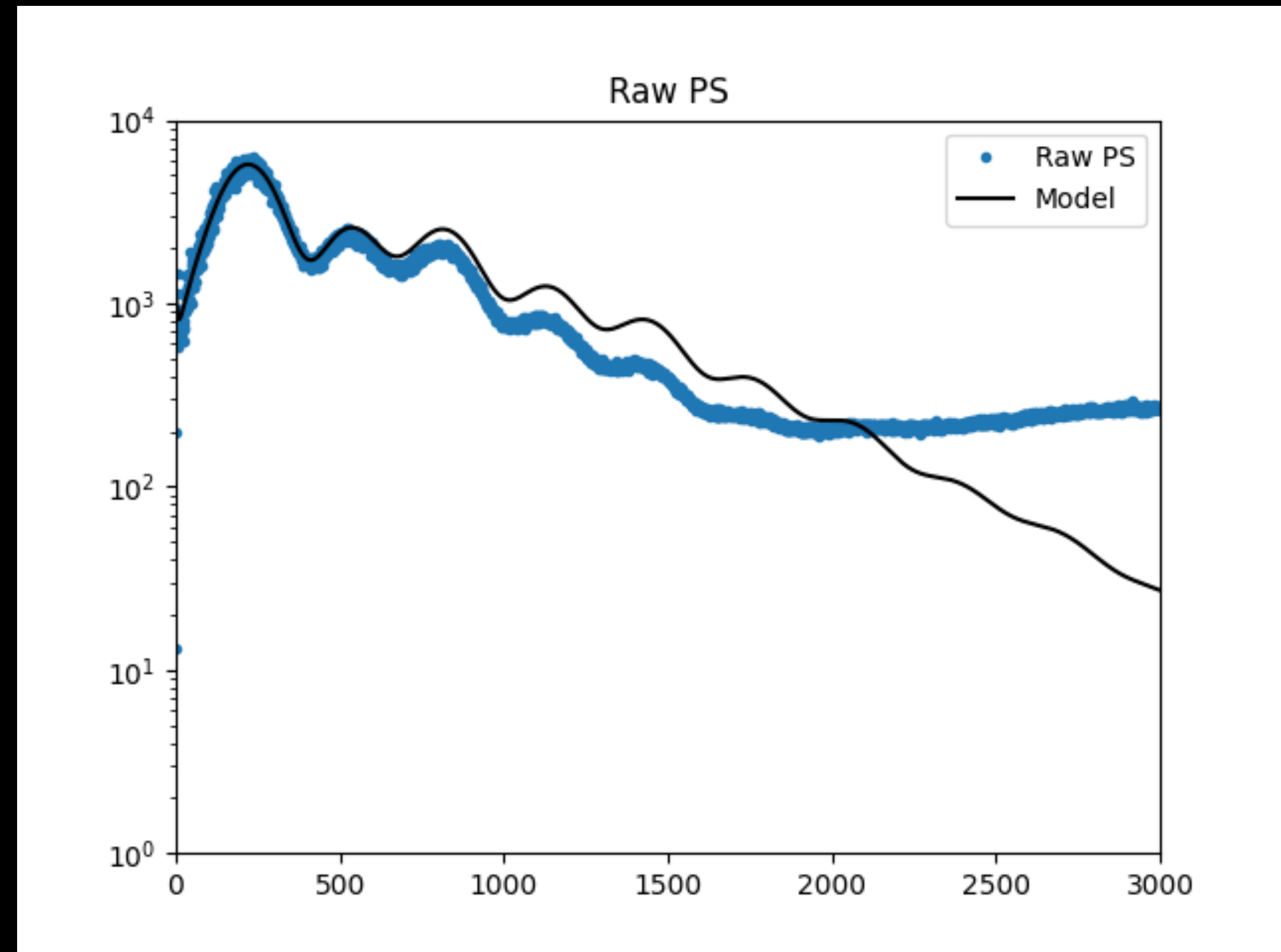# PS From All-sky Maps

Planck Map (Foreground-cleaned)

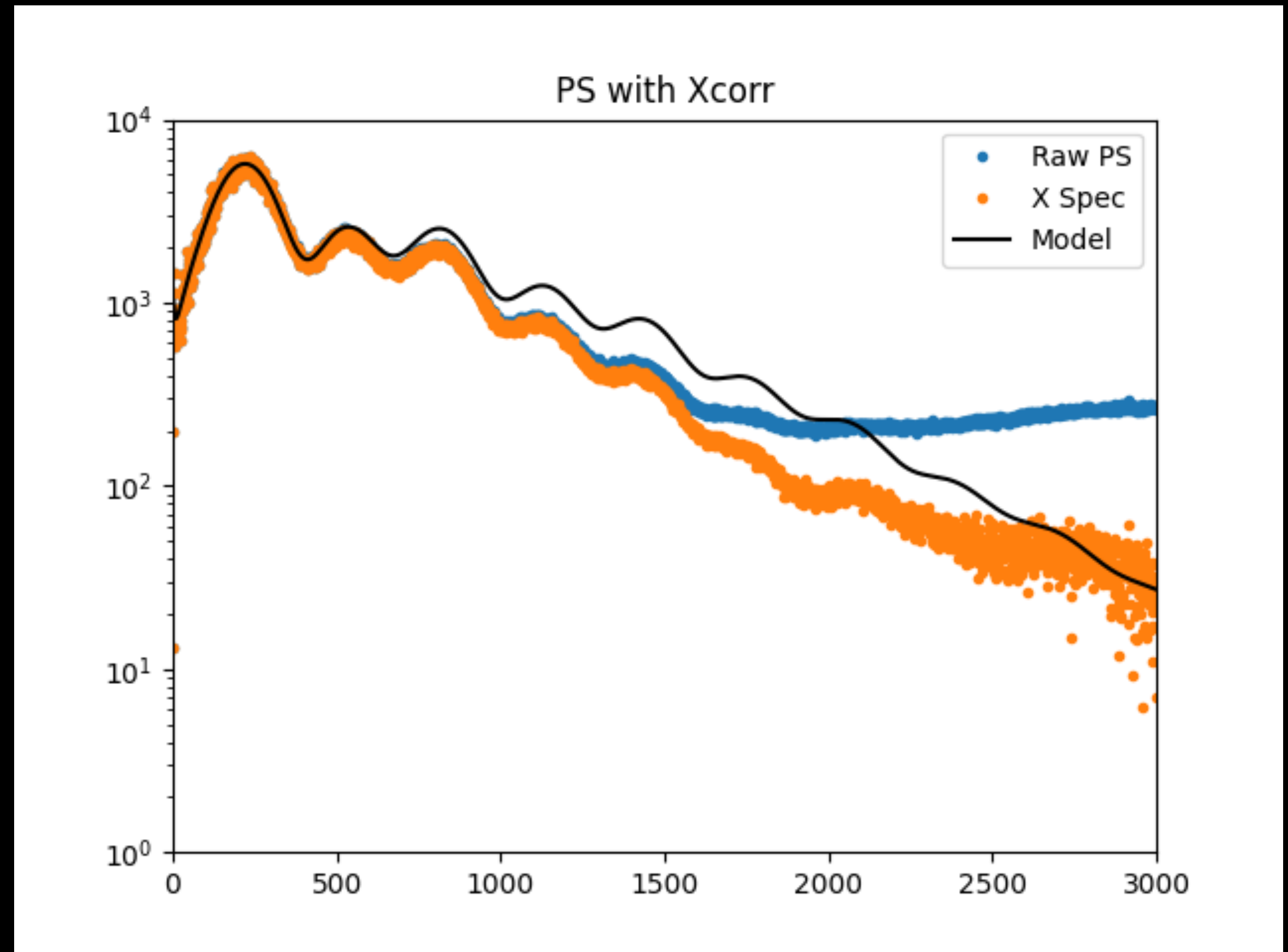# Raw PS

- Spectrum is clearly related, but some issues.

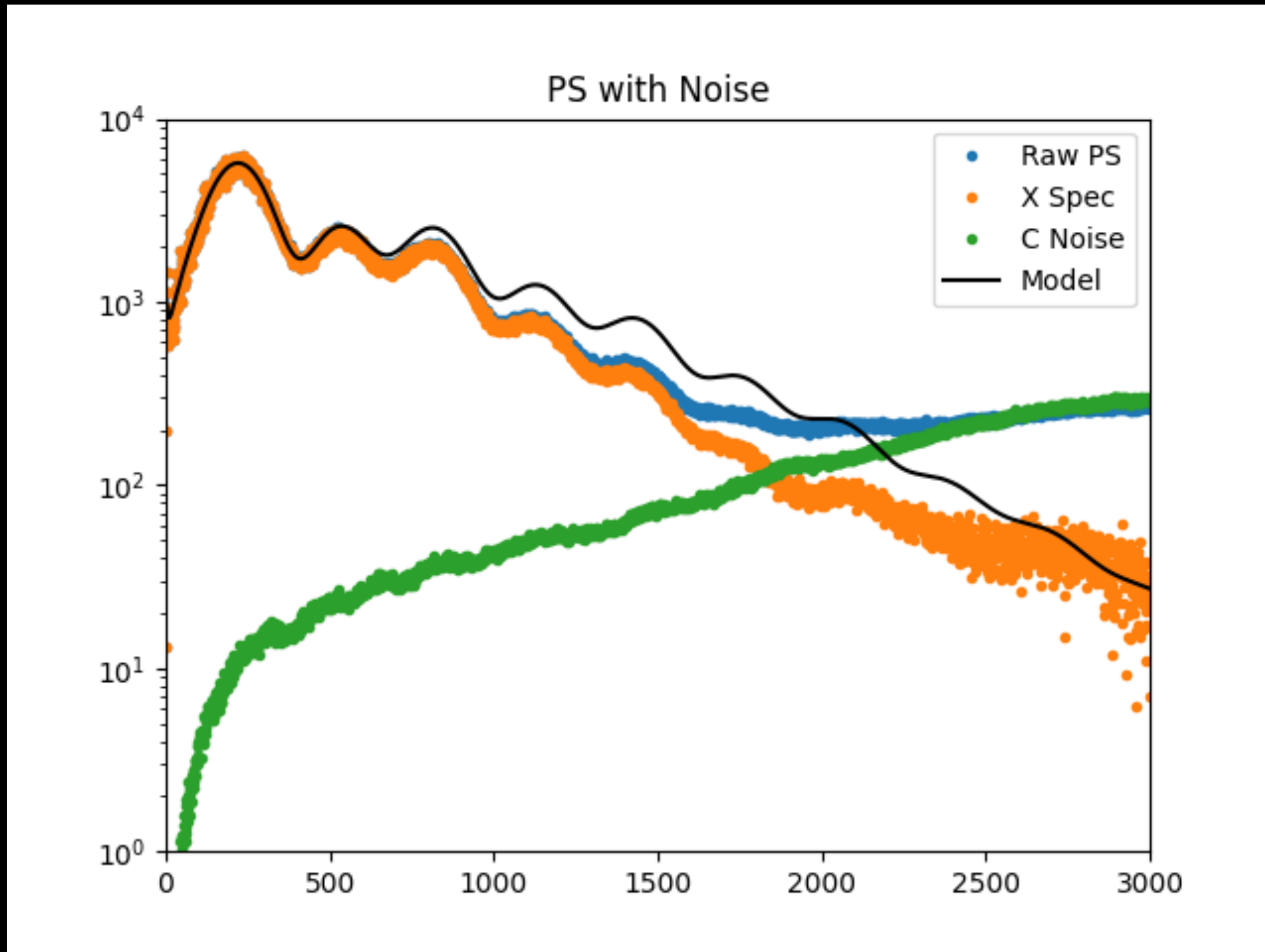- Orange is best-fit from papers. Spectrum is below model at l=1500, above at l=2500.

X-Spec

- Map=signal+noise

- $C_l=C_l$(signal)+C_l(noise)

- Split data in half:
  a_{lm1}=SHT(map 1),
  a_{lm2}=SHT(map 2)

- $<a_{lm1}^*a_{lm2}>$=Cl(signal)
  +$n_{lm1}^*n_{lm2}$= Cl(signal)

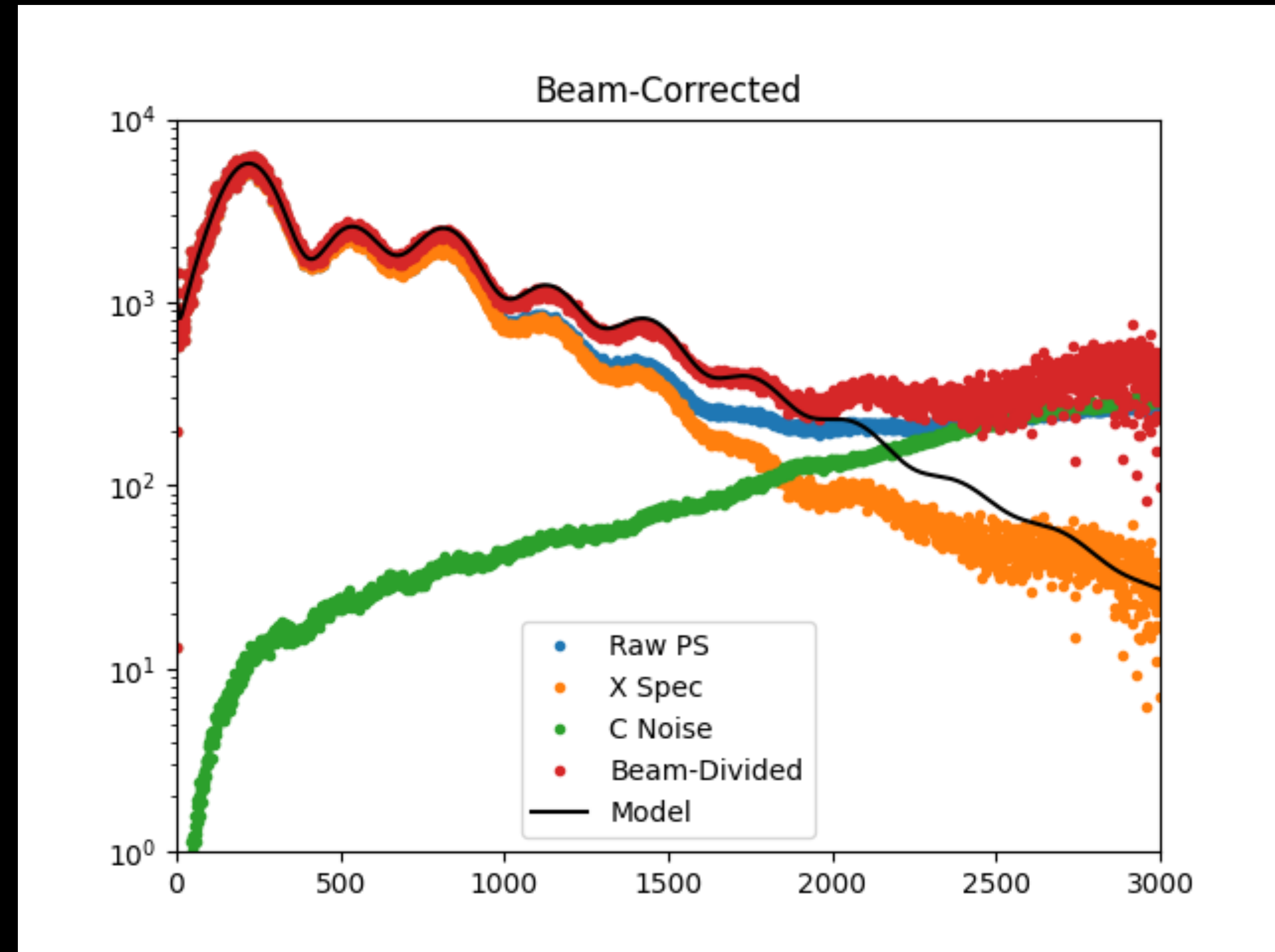- We've lost some SNR, but turns out with more splits we can buy back.

Noise Spec

- We can also check PS of map difference. Gives us estimate of noise.

- NB - σ(m1-m2)=2σ((m1-m2)/2)

Beams

- In real space, we measure sky convolved with instrument beam.

- In FT, we then measure sky transform times beam transform

- SHT similar (for circular beam): $C_{l,obs}=C_{l,true}B_l$.

- B_l=Gaussian, σ~1300

What Else could be Wrong?

- Our beam guess was sloppy. Should really use real beam

- Beam also frequency-dependendent. This map combination of others, so should use all beams for all frequencies

- Foregrounds - point sources dominate at high ell (small scales). Residual source contamination could be problem.