Achieved 1/f Noise

ABS, BICEP2/Keck Array, QUIET, ACTPol, SPTpol, PB

Yuji Chinone

UC Berkeley / Kavli IPMU

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Formula

- Model a Nl by 1/f noise and estimate an "effective" Nl from an actual error bar reported in a paper

$$N_\ell = N_0 \left[1 + \left(\frac{\ell}{\ell_{\rm knee}} \right)^\alpha \right]$$

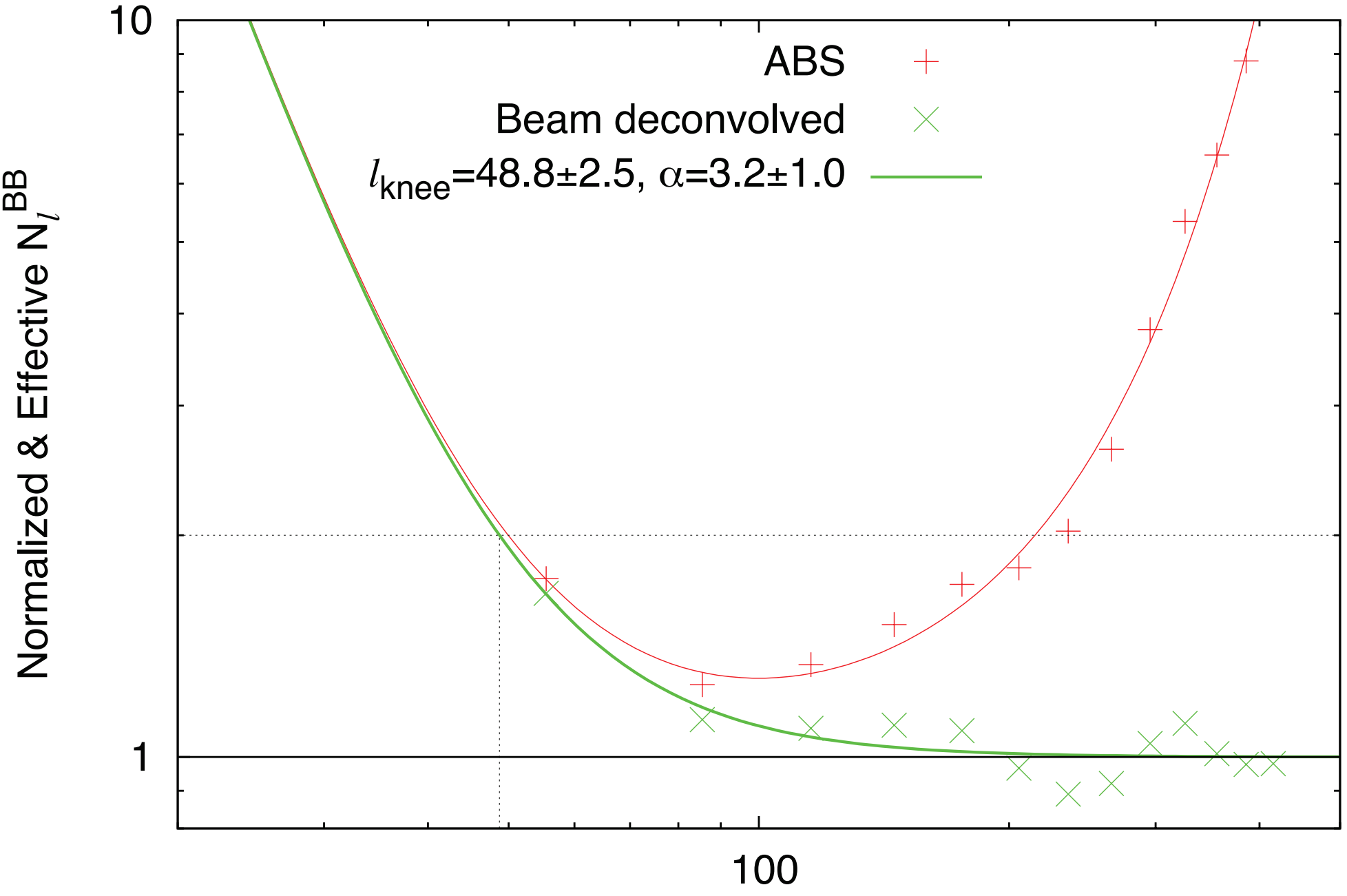
Note: N_l @ knee = 2 x N_0

$$\hat{N}_\ell = \Delta D_\ell \Big/ \frac{\ell(\ell+1)}{2\pi} \sqrt{\frac{2}{(2\ell+1)\Delta\ell f_{\rm sky}}}$$

error bar from a paper

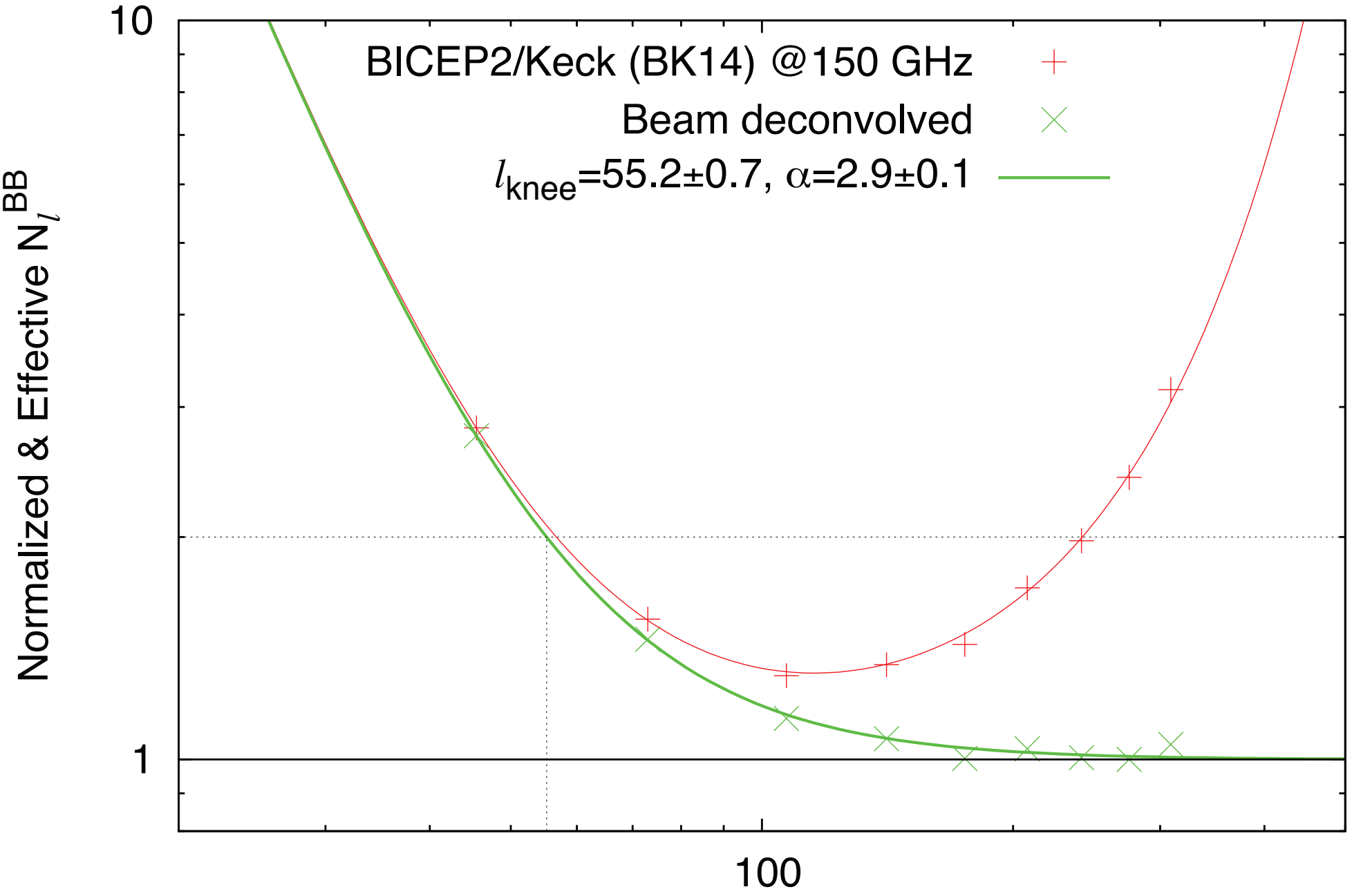
and normalize by N_0

ABS 145 GHz



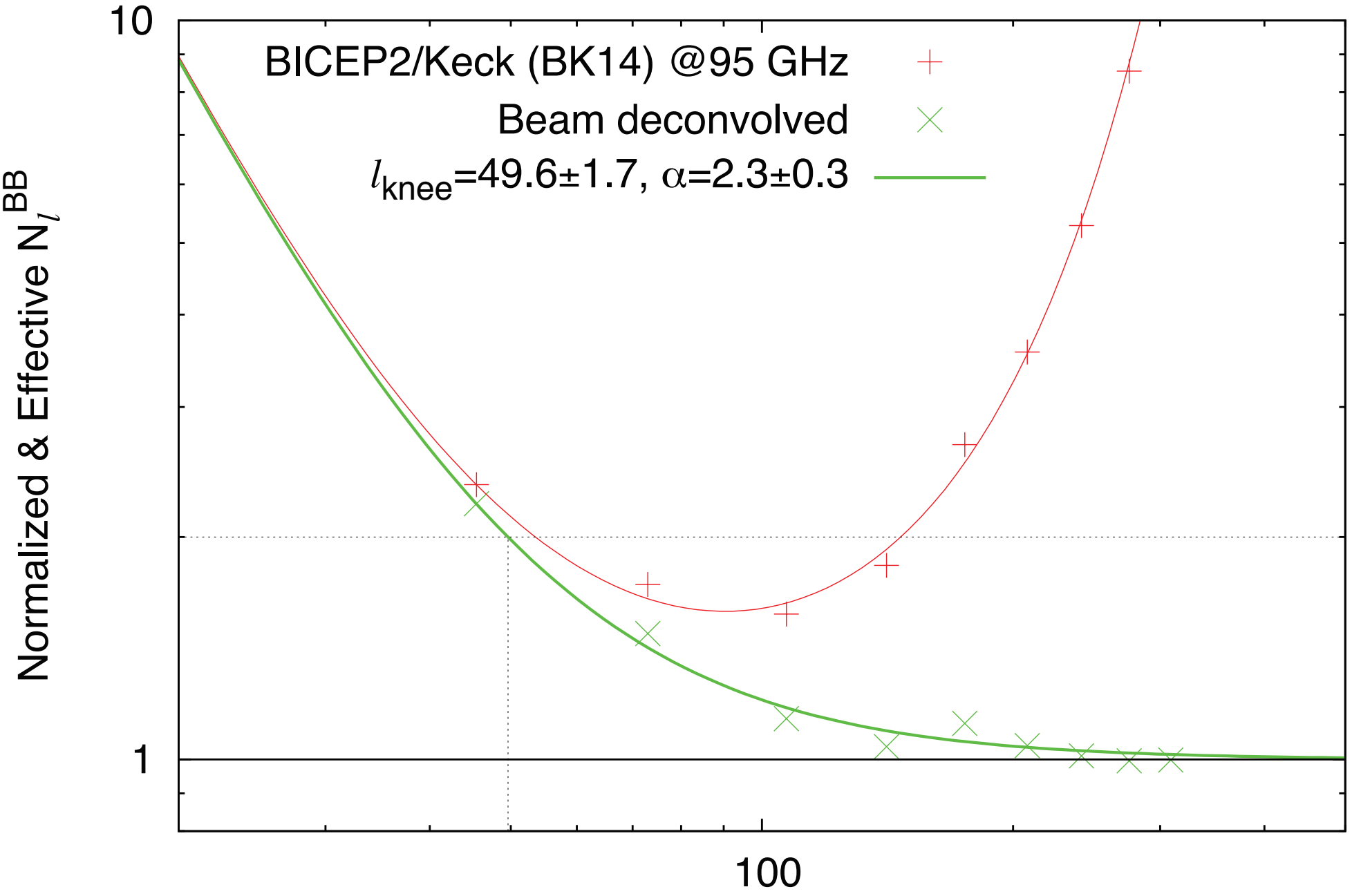
arXiv:1801.01218

BICEP2/Keck Array (BK14) 150 GHz



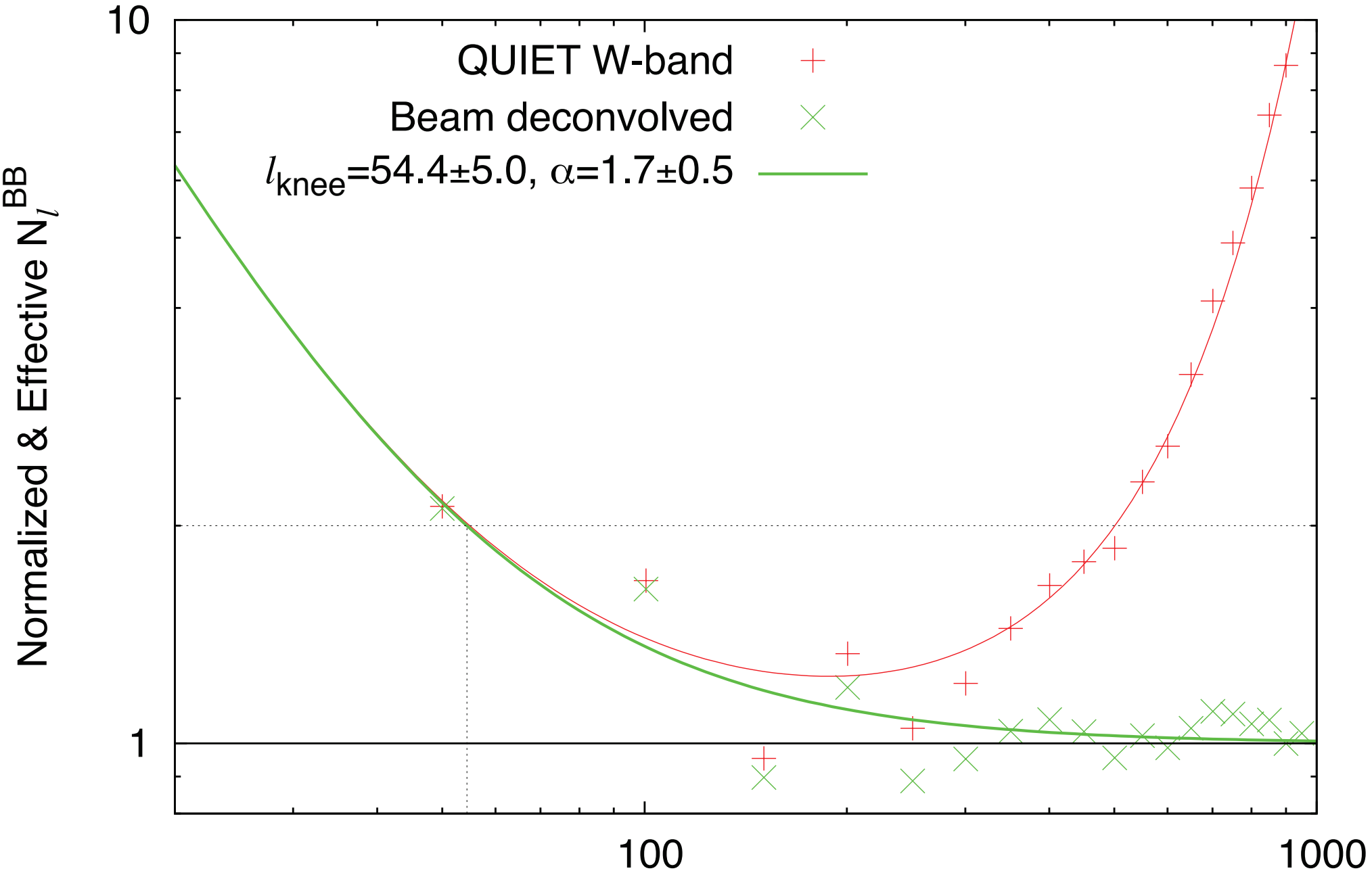
arXiv:1510.09217

BICEP2/Keck Array (BK14) 95 GHz



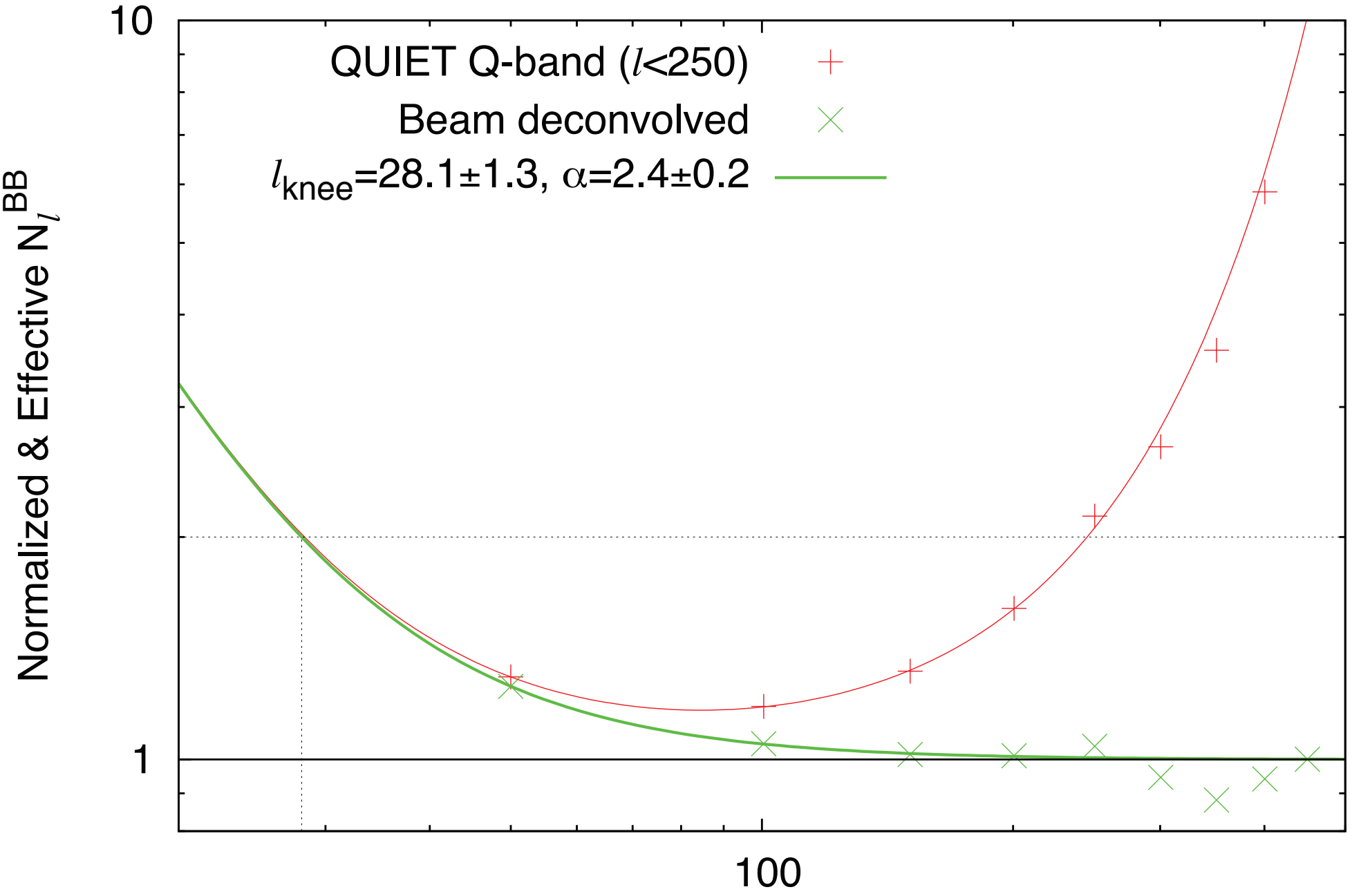
arXiv:1510.09217

QUIET W-band (95 GHz)



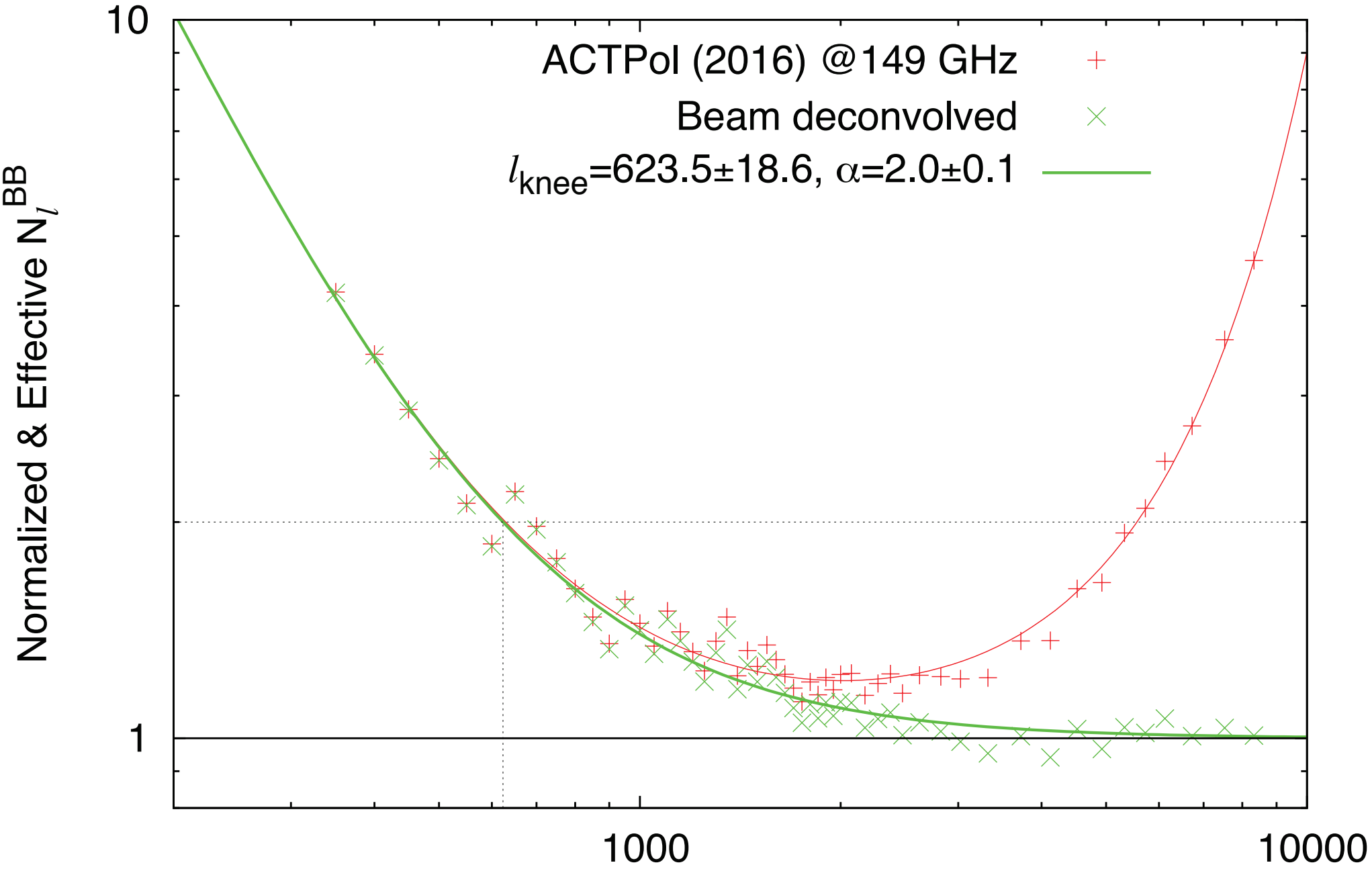
arXiv:1207.5034

QUIET Q-band (43 GHz)



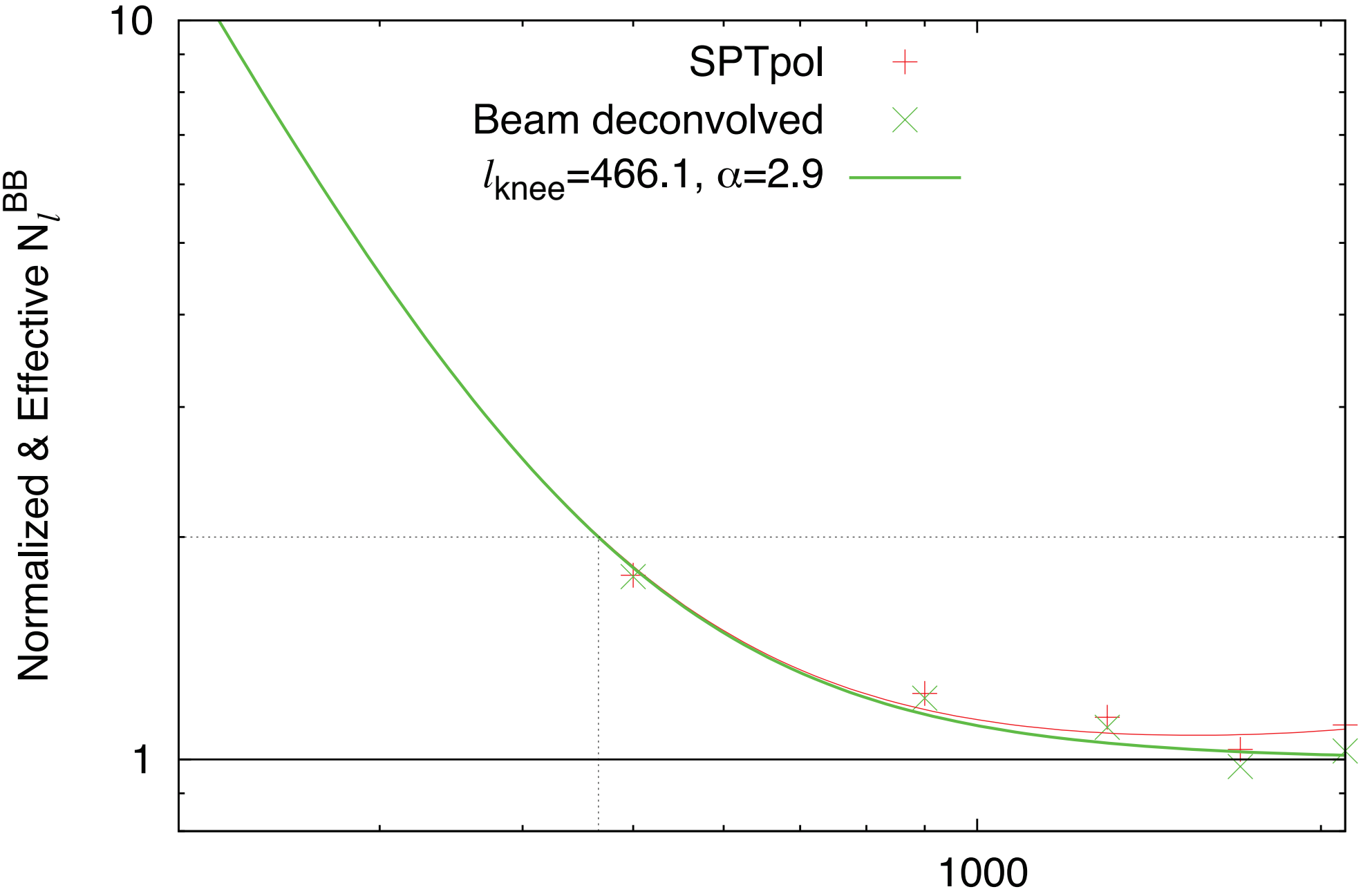
arXiv:1012.3191

ACTPol 149 GHz (2016)



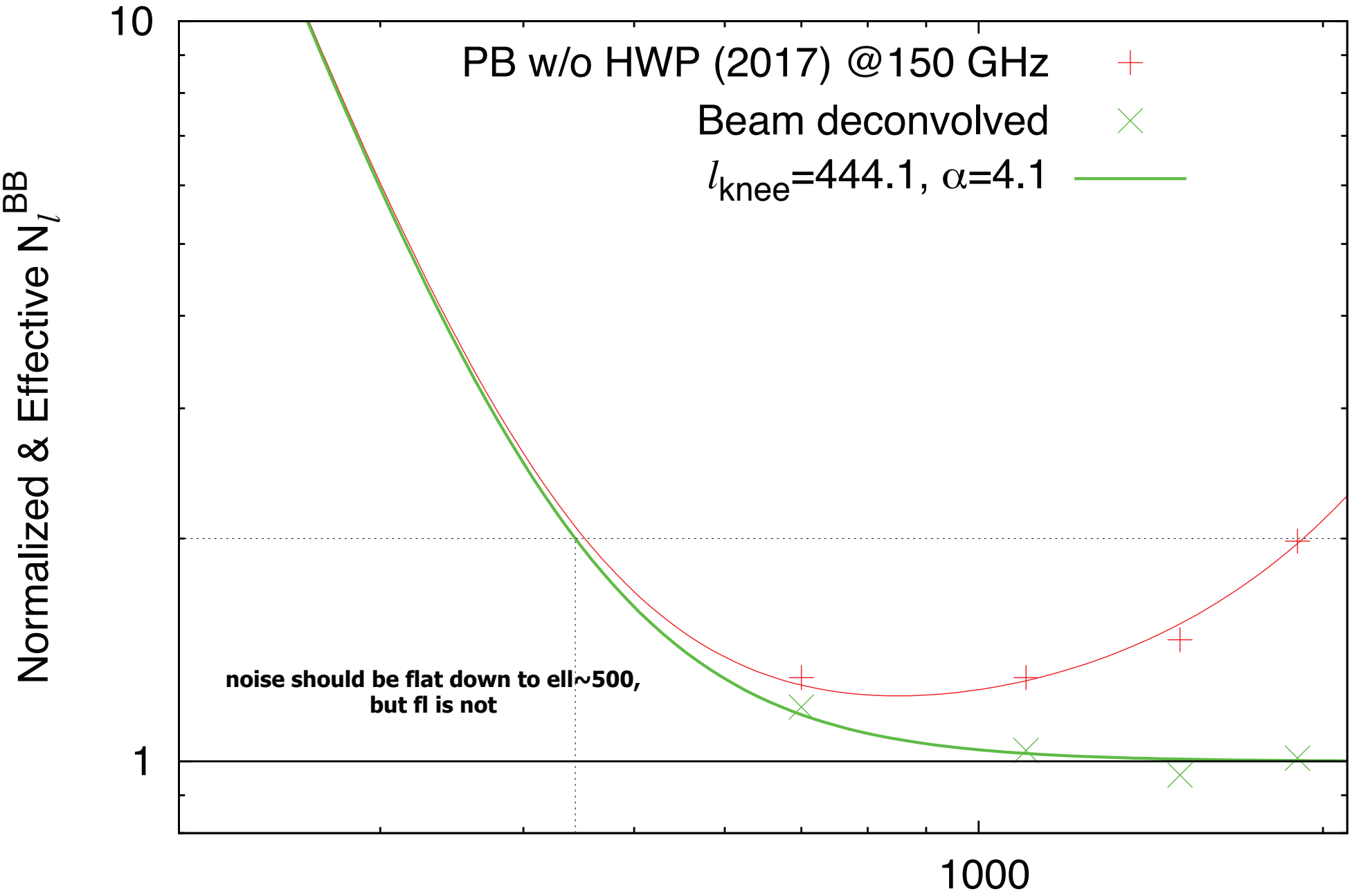
arXiv:1610.02360

SPTpol (2015)



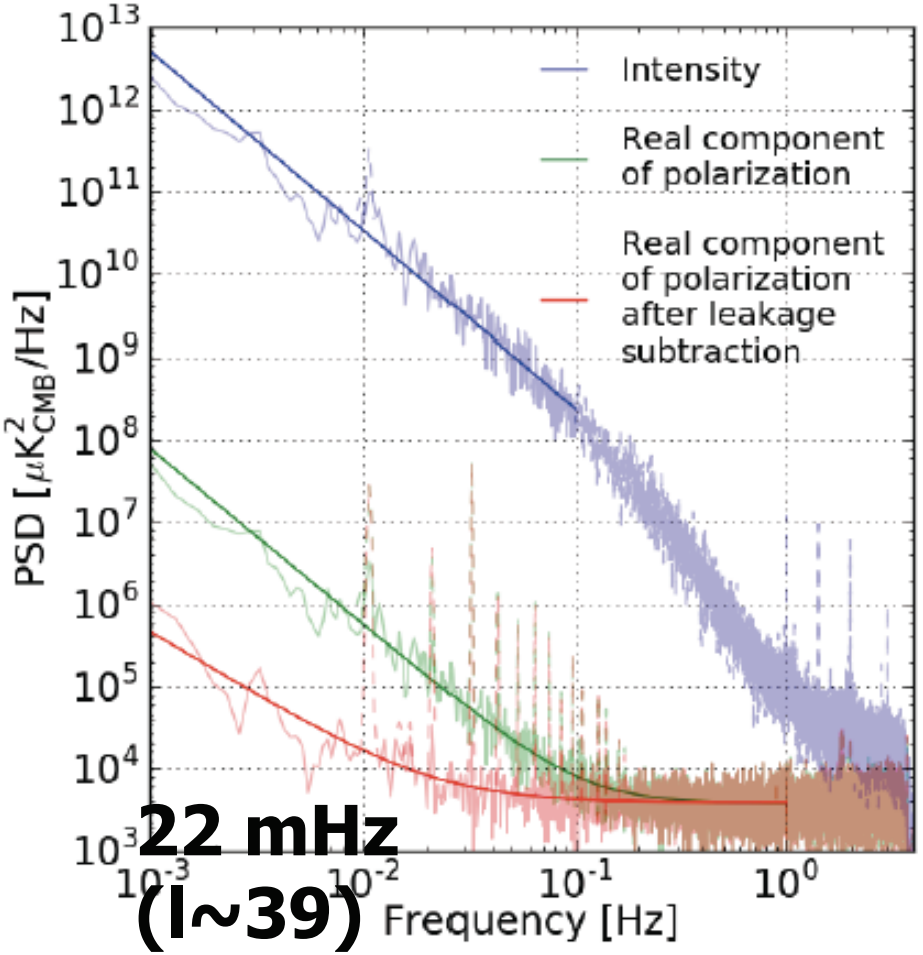
arXiv:1503.02315

POLARBEAR Small Patch w/o HWP 150 GHz (2017)

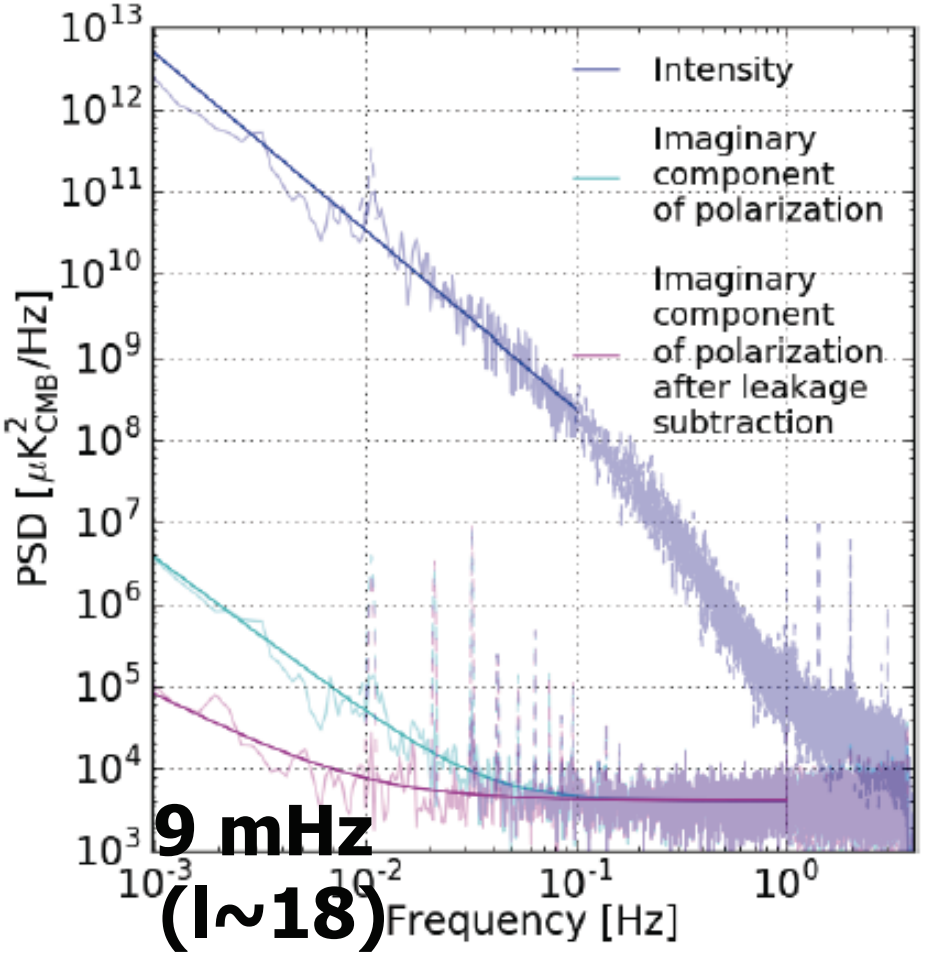


arXiv:1705.02907

POLARBEAR Large Patch w/ HWP



22 mHz (l~39)



9 mHz (l~18)

$$d'_{\bar{d}}(t) = \varepsilon[Q_{\rm in}(t) + iU_{\rm in}(t)] + A^{(4)}_{0|\langle I_{\rm in}\rangle} + \lambda^{(4)}\delta I_{\rm in}(t) + \mathcal{N}^{(\rm Re)}_{\bar{d}}(t) + i\mathcal{N}^{(\rm Im)}_{\bar{d}}(t)\,,$$

with

$$\lambda^{(4)} \equiv \lambda^{(4)}_{\rm opt} + 2g_1 A^{(4)}_{0|\langle I_{\rm in}\rangle} + i\omega_{\rm mod}\tau_1 A^{(4)}_{0|\langle I_{\rm in}\rangle}\,.$$

arXiv:1702.07111