

T to P leakage for SPT

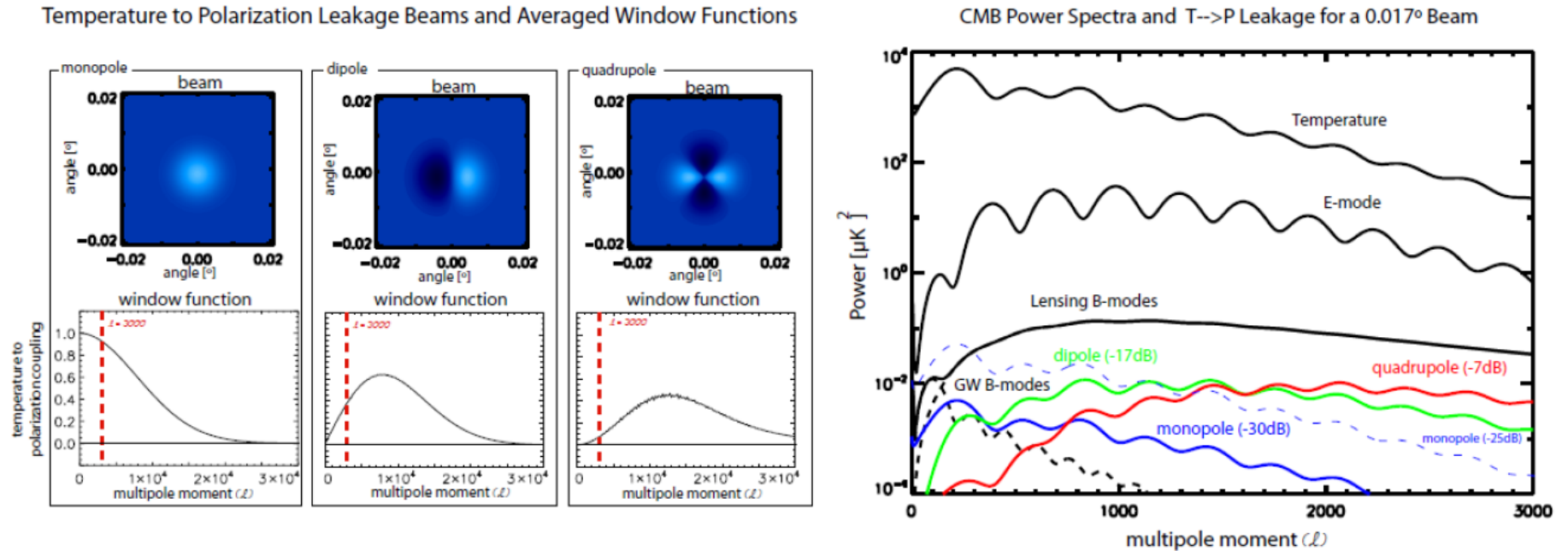


Figure 5. Effects of temperature to polarization ($T \rightarrow P$) leakage for the SPT beam size ($1'$) and the requirements for leakage suppression. *Left*: Beam shapes for monopole, dipole, and quadrupole $T \rightarrow P$ leakage and the corresponding azimuthally averaged window functions, which give the $T \rightarrow P$ leakage as a function of multipole moment ℓ . Note the dipole and quadrupole leakage are highly suppressed by the small SPT beam size where the B-modes peak below $\ell = 3000$. Monopole leakage is accounted for with careful relative calibration, see Section 5.2.3. *Right*: Simulations of the CMB auto-correlation power spectra (Temperature, E-mode, and B-mode) and the leakage power spectra due to monopole (blue), dipole (green), and quadrupole (red) leakage when suppressed by -30 dB, -17 dB, and -7 dB respectively, which keep the $T \rightarrow P$ leakage at least -10 dB below the B-mode signal.