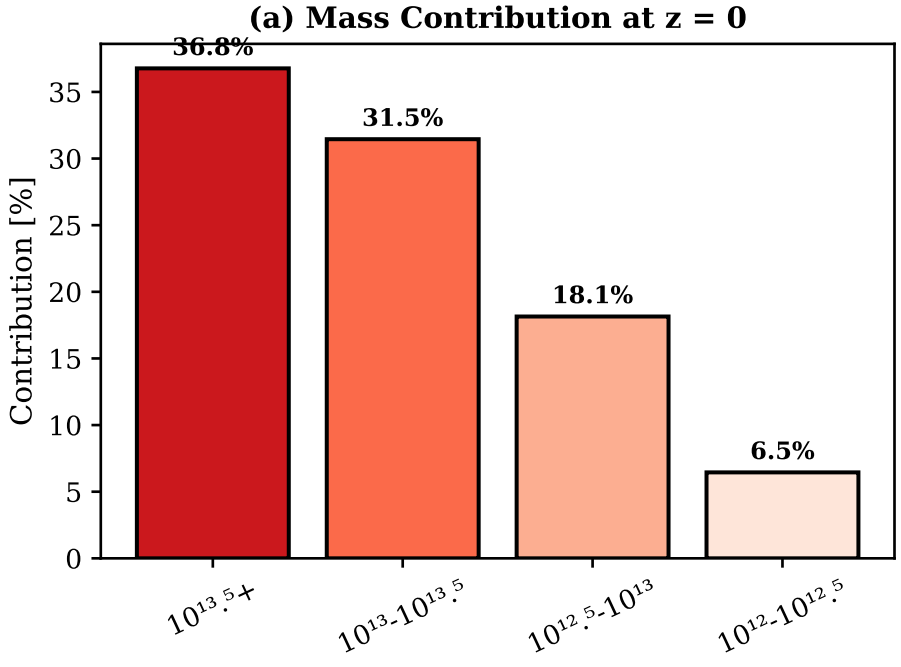
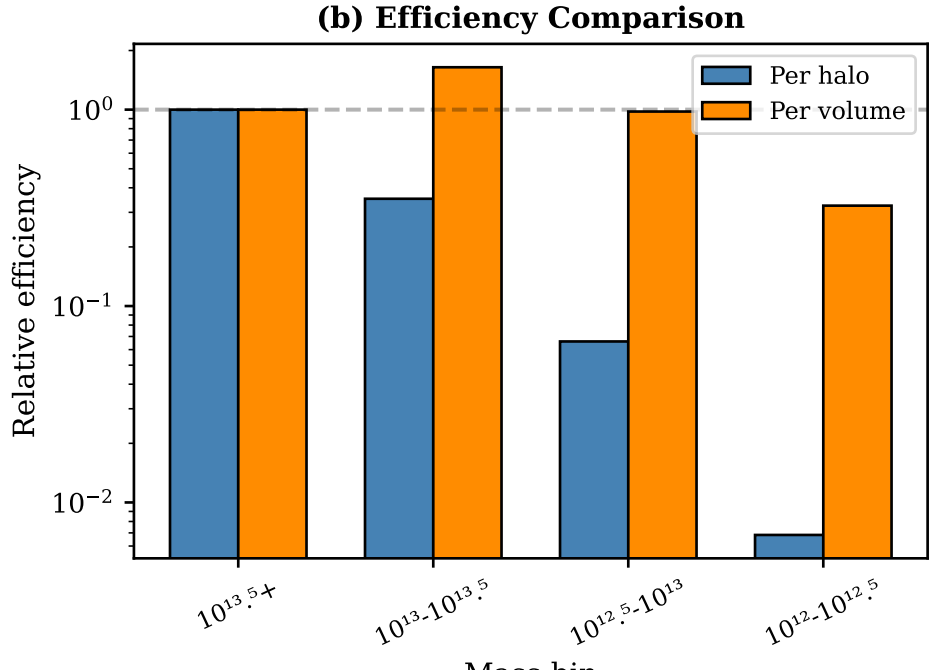
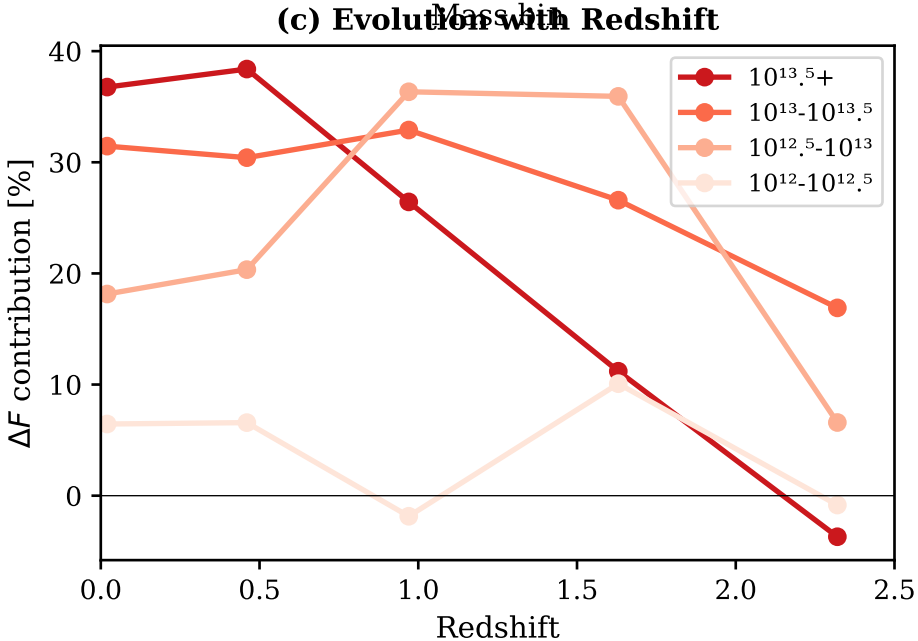
Baryonic Effects on P(k): Mass-Scale Requirements







(d) Key Findings

Key Findings at k = 10 h/Mpc:

- At z = 0:
  - M > 10^{13} M⊙/h captures 68% of P(k) suppression
  - 10^{12}-$10^{12.5}$ bin adds only 6.5%
  - Total within $5R_{200}$: 93%
- Per-halo efficiency:
  - Each $10^{13.5}$+ halo: 146× more than 10^{12}-$10^{12.5}$
  - Low-mass halos numerous but weak
- Per-volume efficiency:
  - 10^{13}-$10^{13.5}$ most efficient (45 %/10^{5}Mpc³)
  - Massive halos not volume-optimal
- Redshift evolution:
  - At z~1: $10^{12.5}$-10^{13} dominates
  - At z>2: Total drops to ~20%

Implication: BCM efforts should prioritize
M > 10^{13} halos at z < 1