

JAX-GRID-SEARCH



$$\mathcal{G} = \{K_{\beta_d}\} \times \{K_{T_d}\} \times \{K_{\beta_s}\}$$

Select cluster config

*select config that  
minimizes variance*

$$\beta^* = \arg \max_{\beta} \ln \mathcal{L}_{\text{spec}}(\beta)$$

optimize spectral parameters

$$\hat{\mathbf{s}} = \left( \mathbf{A}(\beta^*)^\top \mathbf{N}^{-1} \mathbf{A}(\beta^*) \right)^{-1} \mathbf{A}(\beta^*)^\top \mathbf{N}^{-1} \mathbf{d}$$

reconstruct CMB map

$$\sigma_{\text{CMB}}^2 = \langle \text{Var} [\hat{s}_{\text{CMB}}(\hat{n})] \rangle_{\text{noise}}$$

Estimate  $r$  from residual  $B$ -modes

$$-2 \ln L(r) = f_{\text{sky}} \sum_{\ell} (2\ell + 1) \left[ \frac{C_{\ell}^{\text{obs}}}{C_{\ell}^{\text{model}}(r)} + \ln C_{\ell}^{\text{model}}(r) \right]$$

$r$

