

$\zeta_{x,y}$: latent variables, $\{a_i\}$ cut points

$$I_{x,y} = i \quad \text{if } a_i < \zeta_{x,y} \leq a_{i+1}$$

$$\zeta_{x,y} = f_{x,y} + \varepsilon_{x,y}$$

$f_{x,y}$ smooth, $\varepsilon_{x,y}$ extreme value distribution

unknowns $\{a_i\}$, $\{f_{x,y}\}$

E.g. expand f using wavelets