

Vector of input  
parameters  $\mathbf{x} \in \mathbb{R}^M$   
(e.g., soil properties)

Computational  
model  $\mathcal{M}$  (e.g.,  
FEM/FDM)

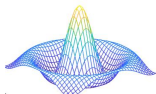
Model response  
 $\mathbf{y} = \mathcal{M}(\mathbf{x}) \in \mathbb{R}^Q$  (e.g.,  
node displacement)

PCA

Principle component  
for input parameters  
 $\mathbf{x}^{PC} \in \mathbb{R}^m (m \ll M)$

PCA

Principle compo-  
nent for output  
 $\mathbf{y}^{PC} \in \mathbb{R}^q (q \ll Q)$



Computational  
model  $\tilde{\mathcal{M}}$  (e.g.,  
PCE)