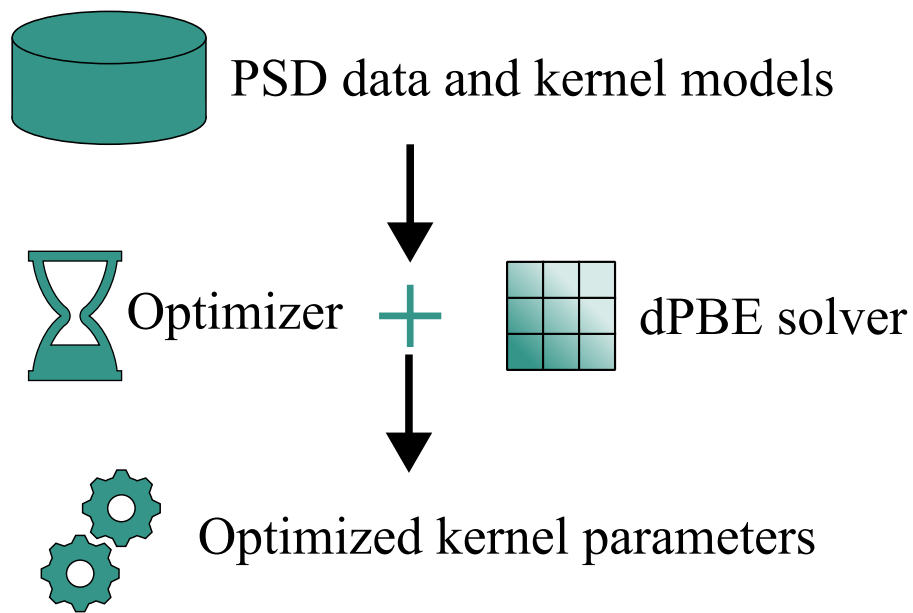


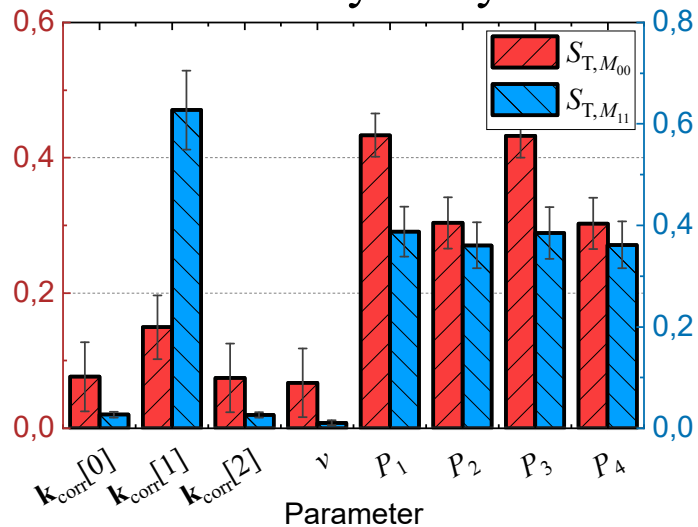
# Optimization-Based Framework for Kernel Parameter Identification in Multi-Material Population Balance Models

## Optimization Framework

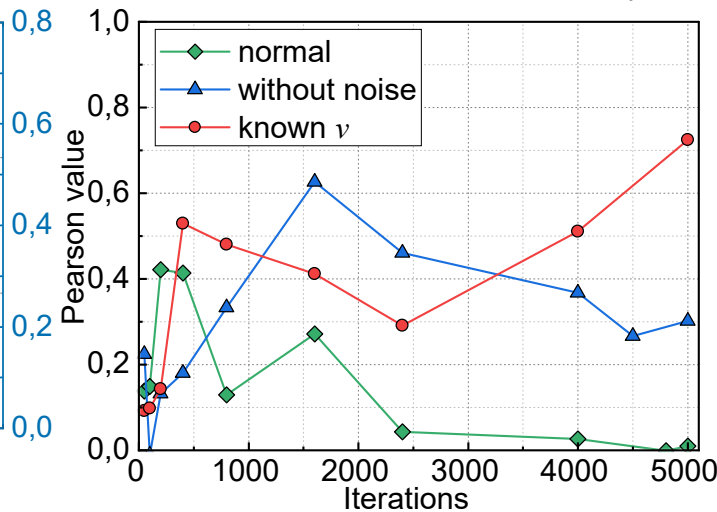
## Performance Analysis



### Sensitivity analysis



### Pearson correlation analysis



## CONCLUSION:

A robust optimization framework improves kernel parameter estimation for 2D PBEs, addressing noise and non-unique solution challenges.