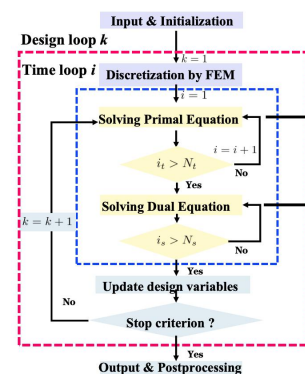


# Primal-dual On-the-fly Reduced-Order Modeling for Large-Scale Transient Dynamic Topology Optimization

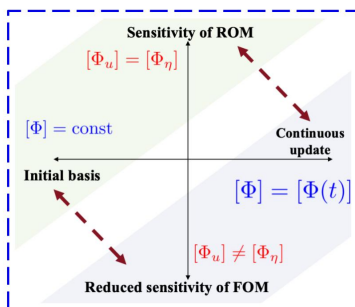
On-the-fly dual reduced order modeling; Proper orthogonal decomposition(POD); Incremental SVD; Dynamic topology optimization.

## Main idea for constructing schemes of primal-dual on-the-fly ROM

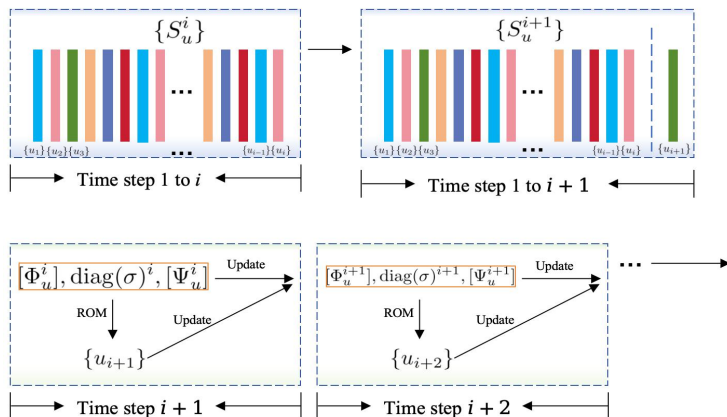
Transient topology optimization flowchart



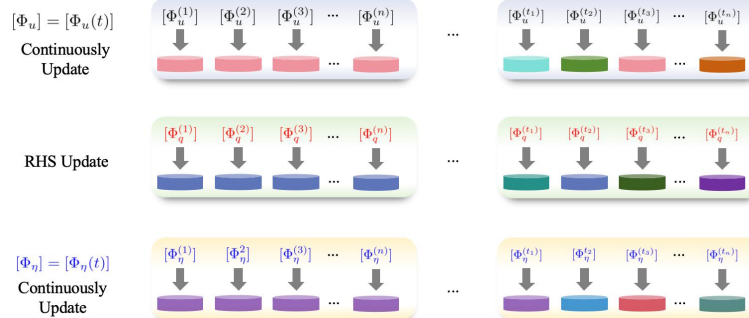
Schemes of primal-dual on-the-fly ROM



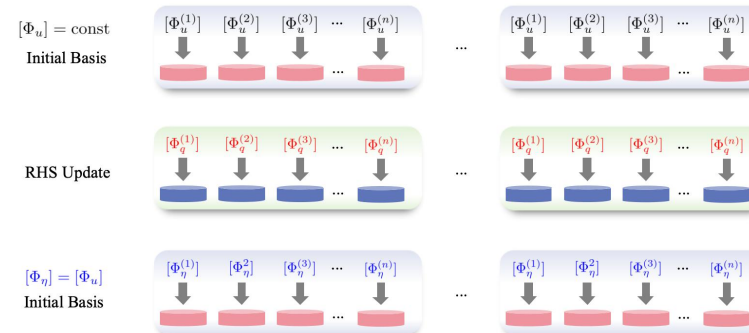
## On-the-fly ROM with incremental SVD



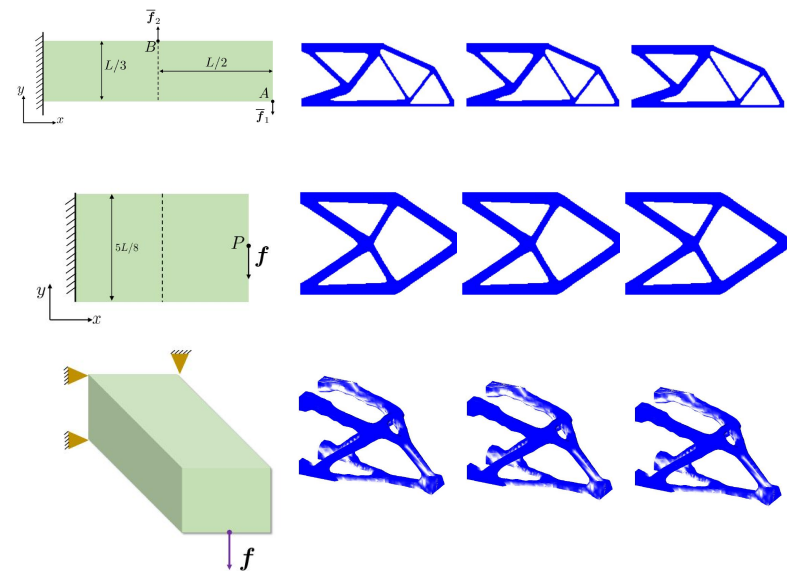
## Primal dual strategy 1 with reduced sensitivity analysis of the full field model (RSOM/OTF)



## Primal dual strategy 2 with sensitivity analysis of the reduced order model (SROM/IB)



## Results for different 2D/3D numerical examples



The acceleration ratio is bigger than 200%

