Test Cases

HFM:

- domain size: 100x50
- cells: 200x70
- aperture : 1/25
- Φ_m = 0.2, K_m = 1Darcy,
- Φ_f = 0.5 ,
  K_f = {10000, 100000, 1000000} Darcy

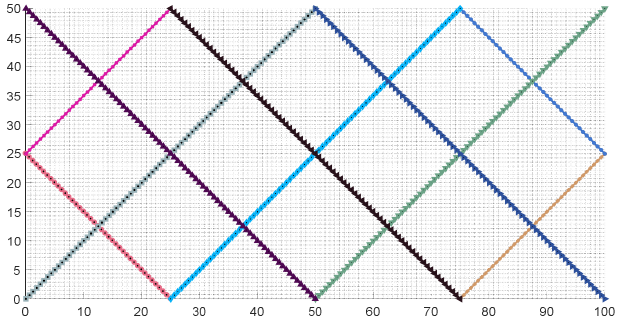
DP:

- domain size: 100x50
- cells: 120 x 1
- Φ_m = 0.2, K_m = 1Darcy,
- $\Phi_{f,\,DP}$ = 0.00221,
  $K_{f,\,DP}$ = {10000, 100000, 1000000}
  * 22.9095/(1e4) Darcy

$$T = \beta \frac{k_{rw}}{\mu} \boldsymbol{K} \nabla p_f \left(s_{w_f} - s_{wm} \right)$$

I

f = 1e3/day
S_w = 1



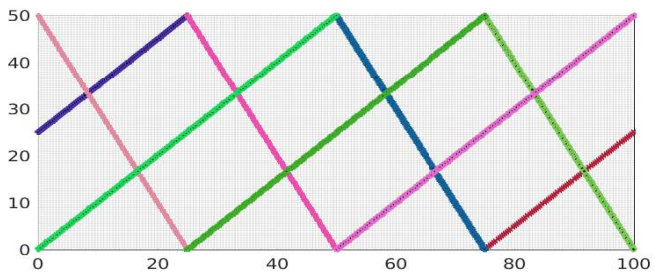
p = 1bar
S_w = 0

Test Cases

-> setups which yield the same DP porosity and DP permeability

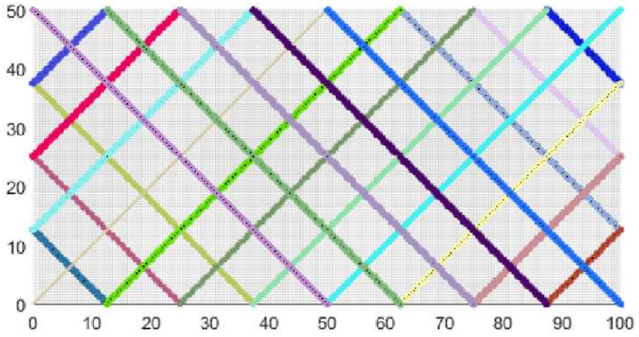
- domain size: 100x50
- cells: 200x70
- aperture : 1/25
- $\Phi_m = 0.2$, $K_m = 1$Darcy,
- $\Phi_f = 0.5$,
  $K_f = \{10000, 100000, 1000000\}$ Darcy

II

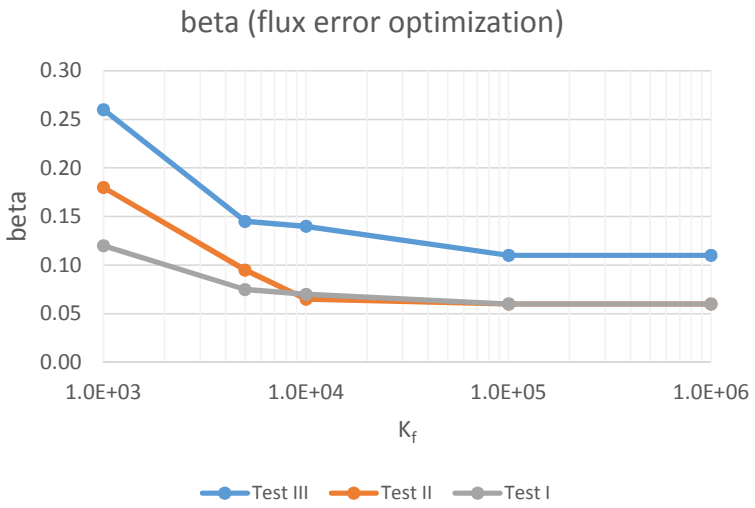


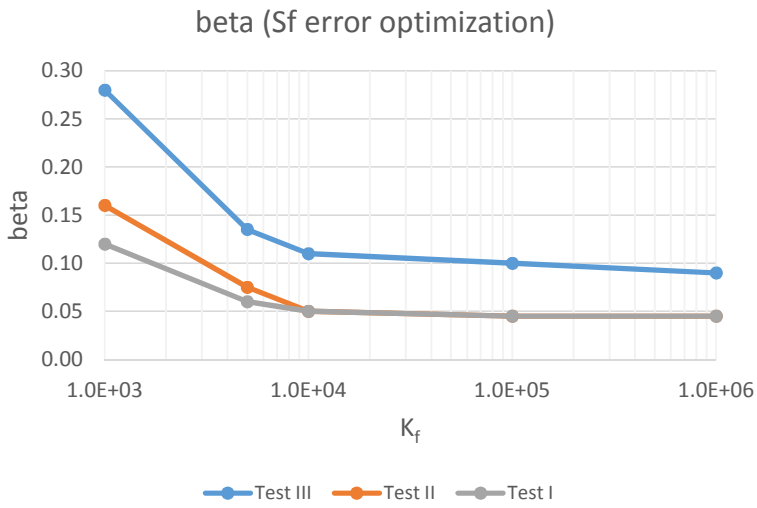
- domain size: 100x50
- cells: 200x70
- aperture : 1/50
- $\Phi_m = 0.2$, $K_m = 1$Darcy,
- $\Phi_f = 0.5$,
  $K_f = \{10000, 100000, 1000000\}$ Darcy

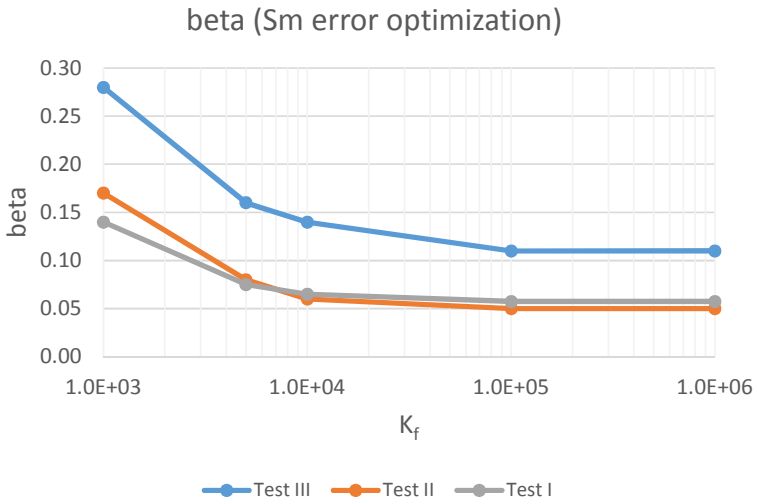
III



Transfer function parameter fitting







Transfer function parameter fitting

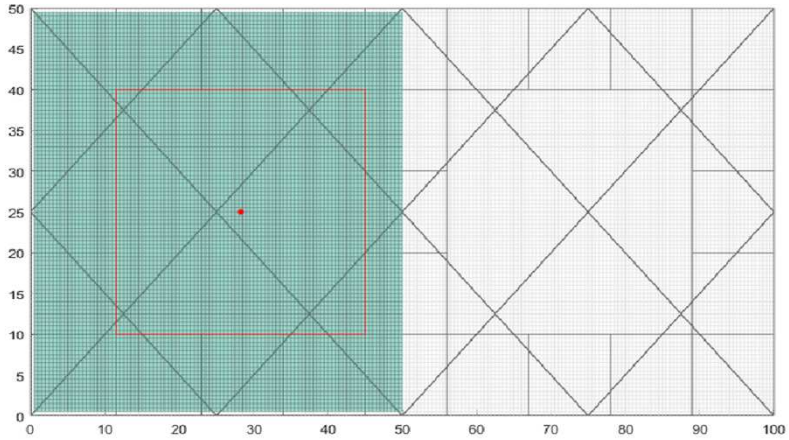
Kfrac	beta	minimizing (L2 error)
1.00E+03	2.60E-01	flux
5.00E+03	1.45E-01	flux
1.00E+04	1.40E-01	flux
1.00E+05	1.10E-01	flux
1.00E+06	1.10E-01	flux
1.00E+03	2.80E-01	satF
5.00E+03	1.35E-01	satF
1.00E+04	1.10E-01	satF
1.00E+05	1.00E-01	satF
1.00E+06	9.00E-02	satF
1.00E+03	2.80E-01	satM
5.00E+03	1.60E-01	satM
1.00E+04	1.40E-01	satM
1.00E+05	1.10E-01	satM
1.00E+06	1.10E-01	satM

Kfrac	beta	minimizing (L2 error)
1.00E+03	1.80E-01	flux
5.00E+03	9.50E-02	flux
1.00E+04	6.50E-02	flux
1.00E+05	6.00E-02	flux
1.00E+06	6.00E-02	flux
1.00E+03	1.60E-01	satF
5.00E+03	7.50E-02	satF
1.00E+04	5.00E-02	satF
1.00E+05	4.50E-02	satF
1.00E+06	4.50E-02	satF
1.00E+03	1.70E-01	satM
5.00E+03	8.00E-02	satM
1.00E+04	6.00E-02	satM
1.00E+05	5.00E-02	satM
1.00E+06	5.00E-02	satM

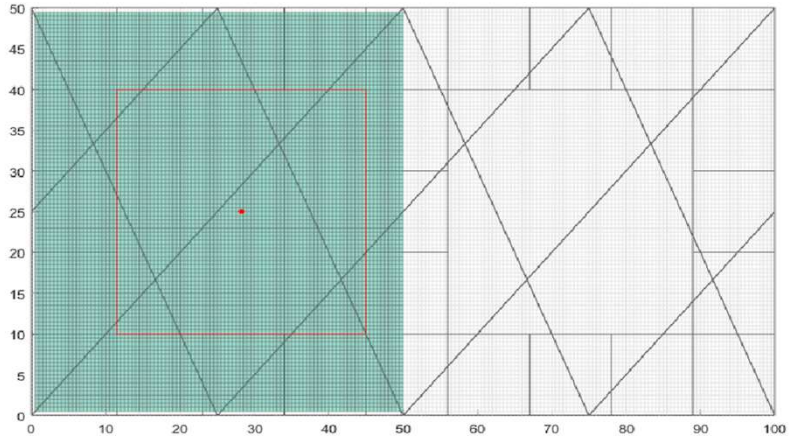
Kfrac	beta	minimizing (L2 error)
1.00E+03	1.20E-01	flux
5.00E+03	7.50E-02	flux
1.00E+04	7.00E-02	flux
1.00E+05	6.00E-02	flux
1.00E+06	6.00E-02	flux
1.00E+03	1.20E-01	satF
5.00E+03	6.00E-02	satF
1.00E+04	5.00E-02	satF
1.00E+05	4.50E-02	satF
1.00E+06	4.50E-02	satF
1.00E+03	1.40E-01	satM
5.00E+03	7.50E-02	satM
1.00E+04	6.50E-02	satM
1.00E+05	5.75E-02	satM
1.00E+06	5.75E-02	satM

Basis Functions – Matrix

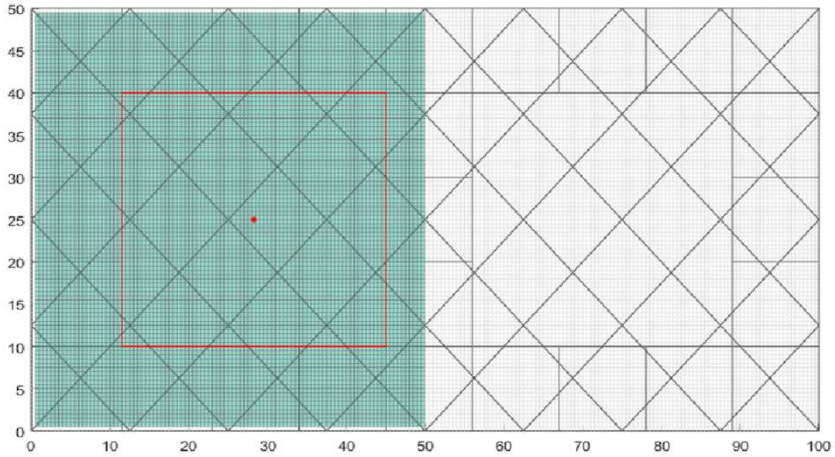
I



II



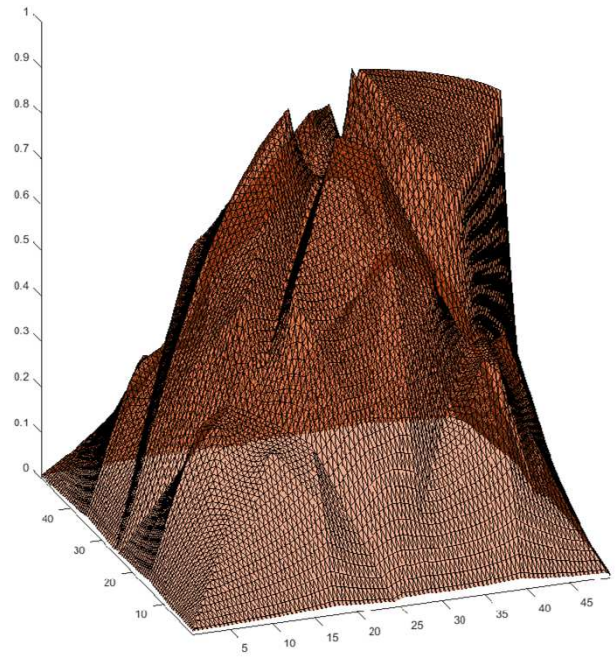
III



Basis Functions – Matrix

K_f = 1.2e3

I



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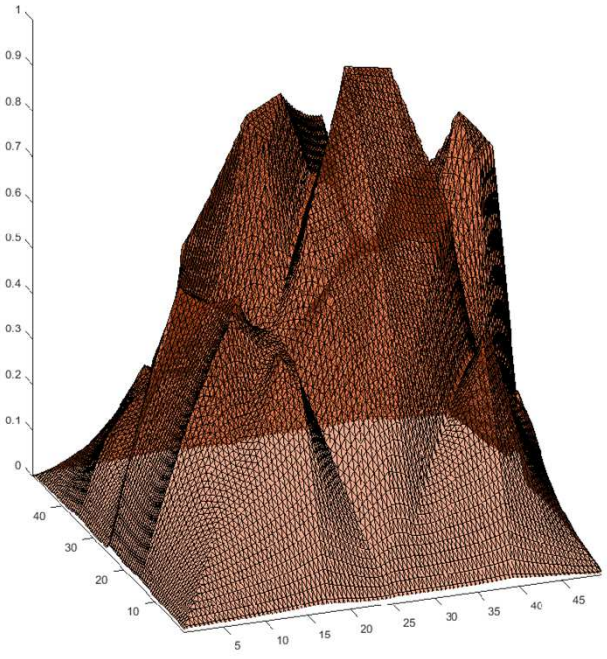

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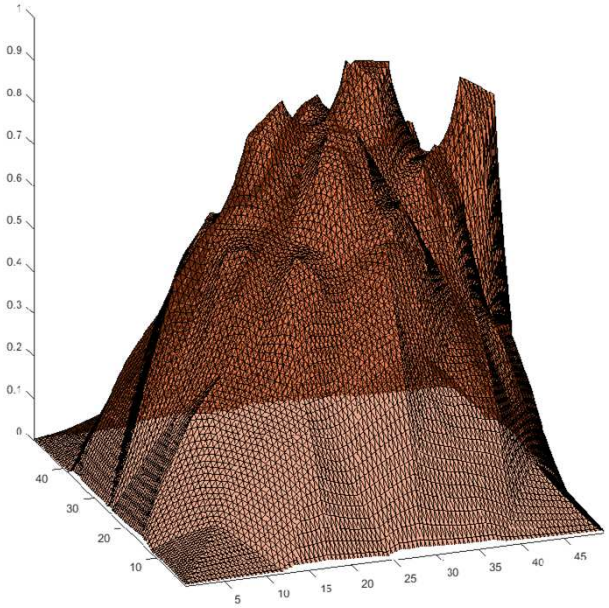
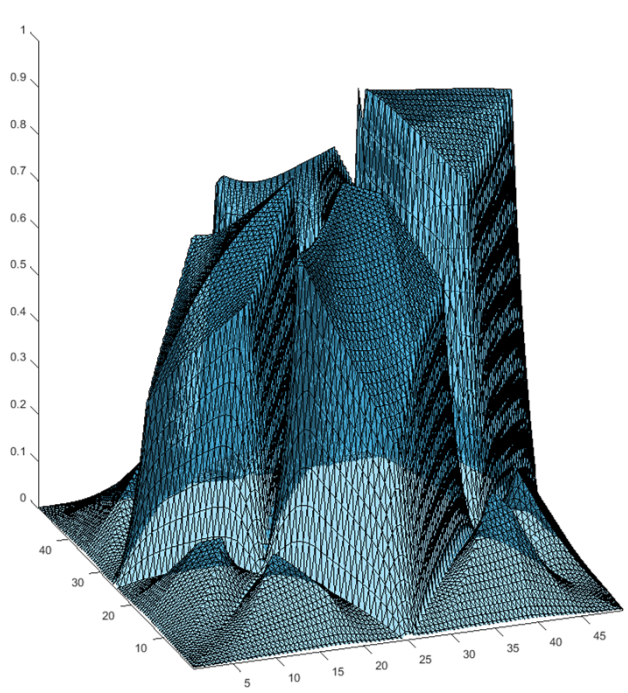


Basis Functions – Matrix

K_f = 1e4

I



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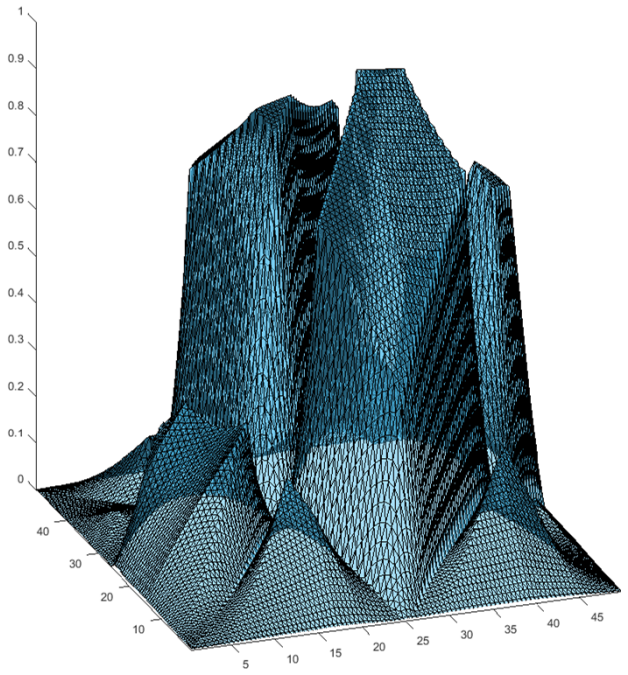

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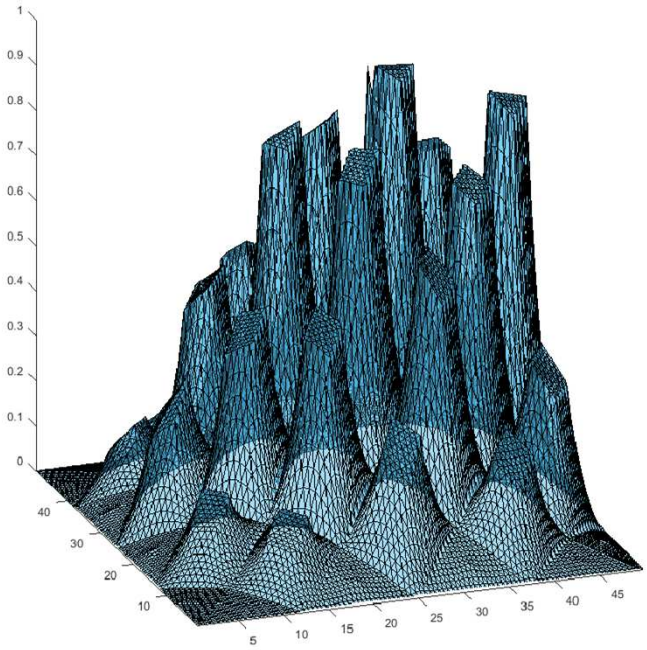
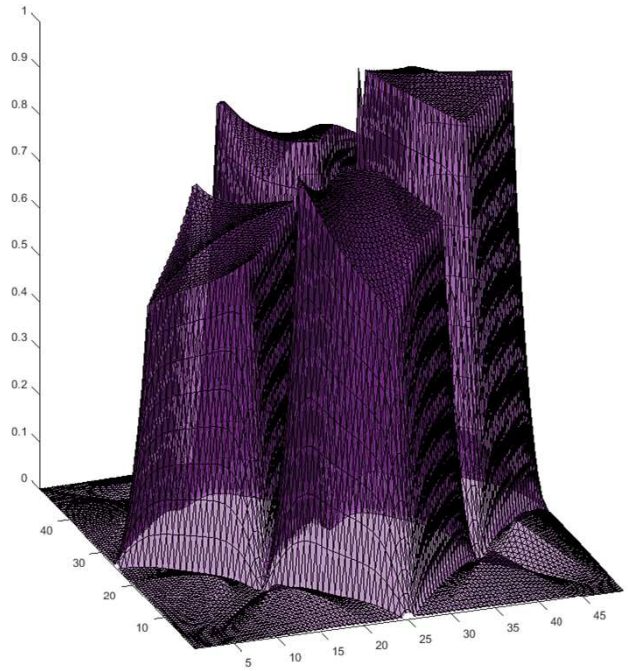


Basis Functions – Matrix

K_f = 1e5

I



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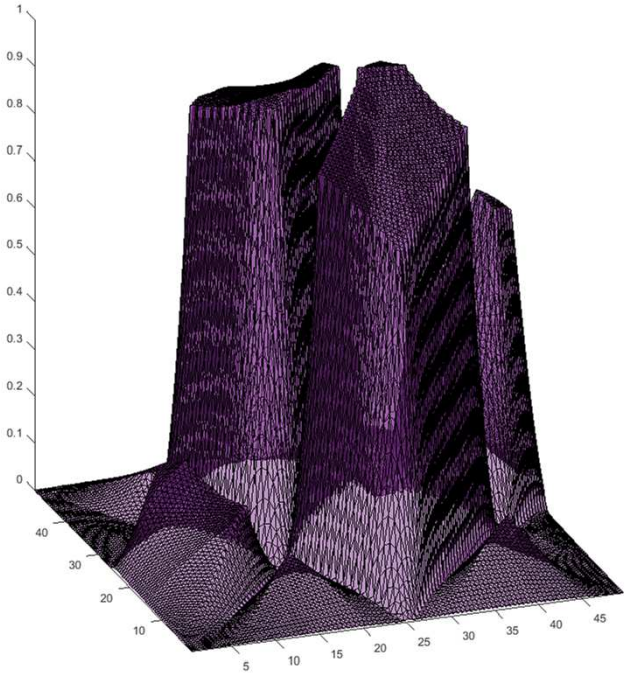
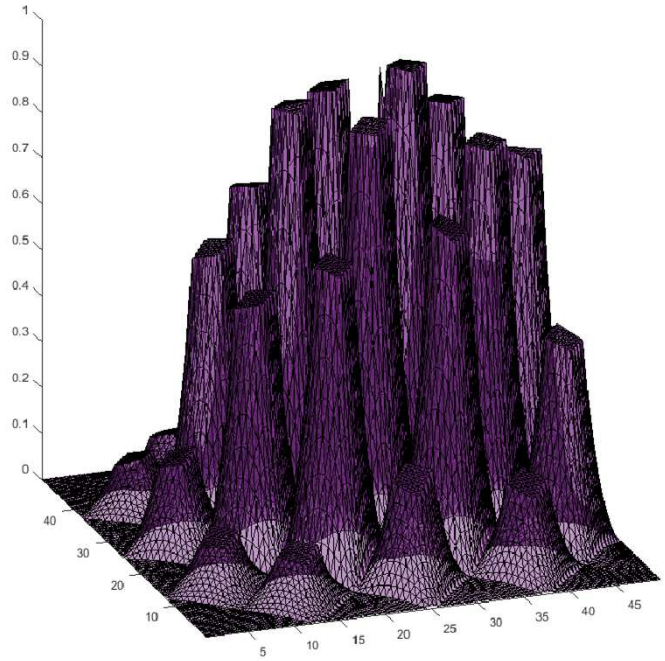


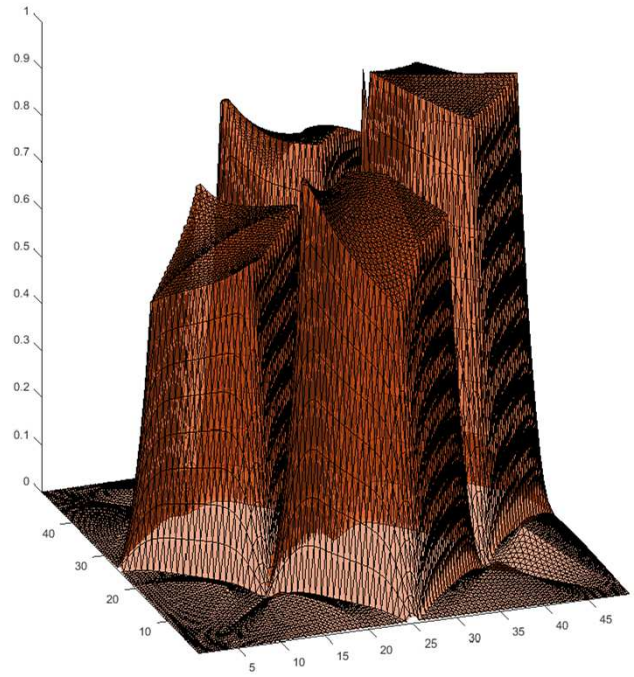
III



Basis Functions – Matrix

K_f = 1e5

I



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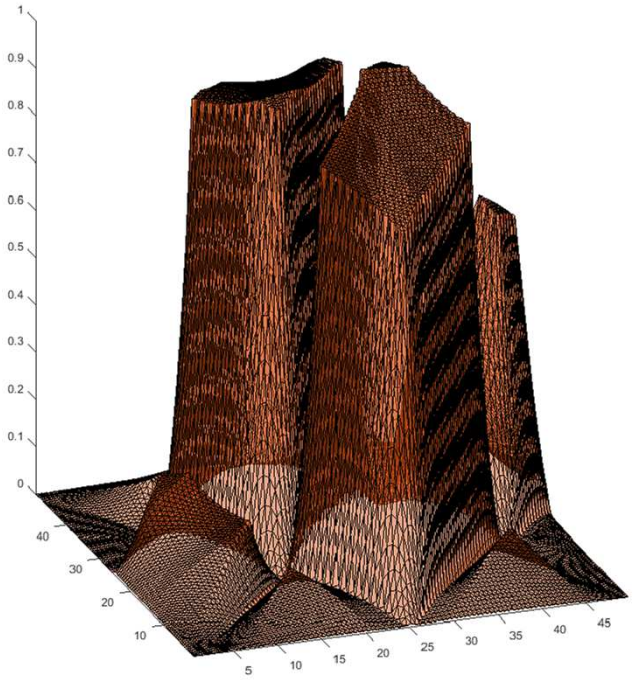

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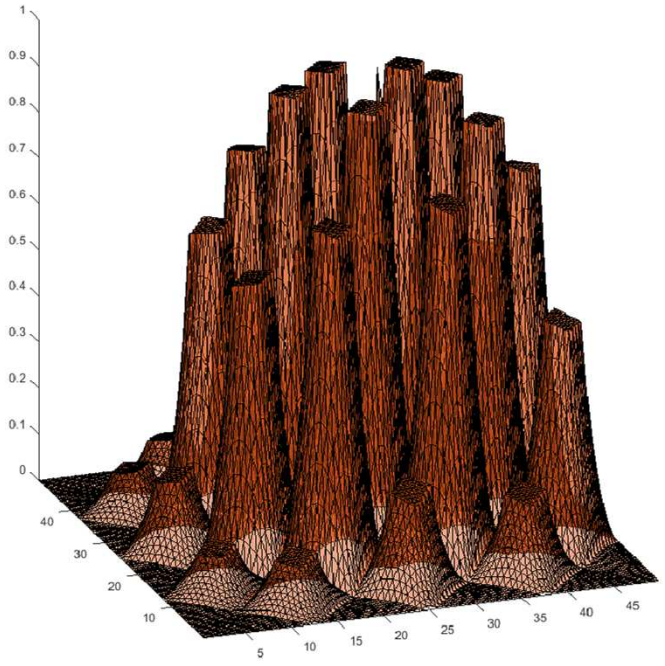
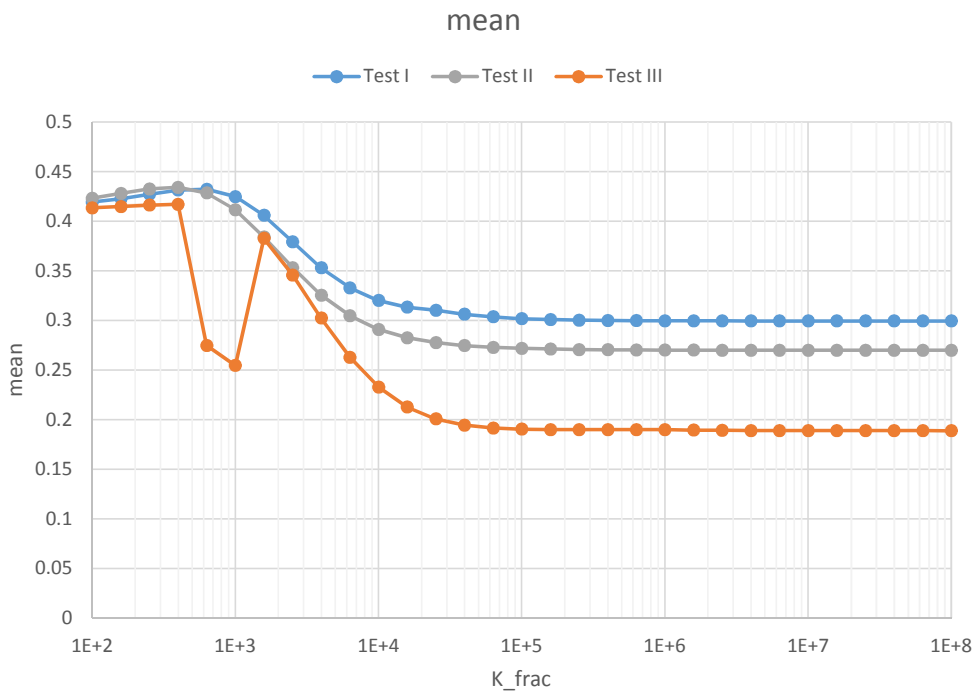
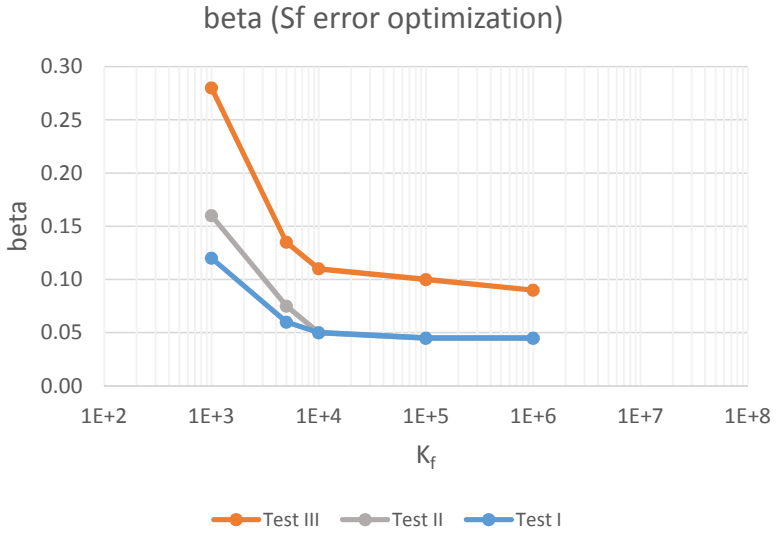
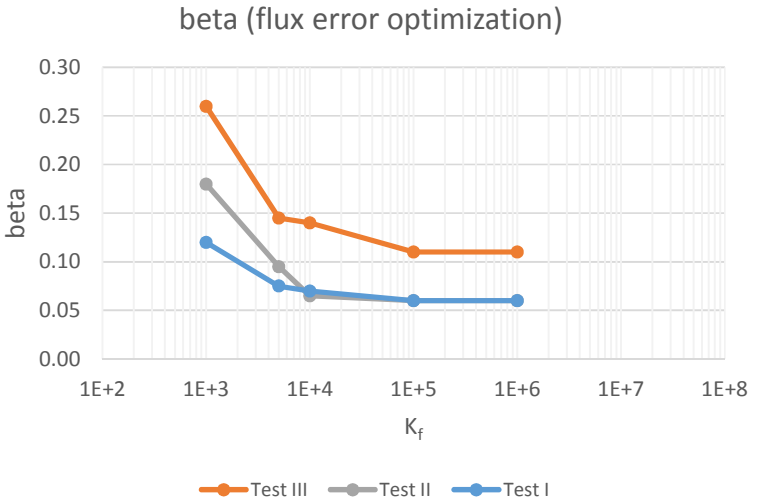


Basis Functions – Fracture

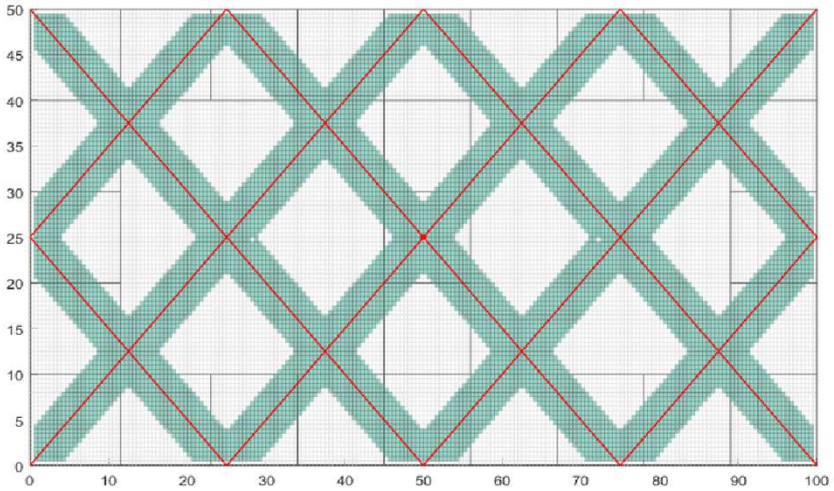






Basis Functions – Fracture

I



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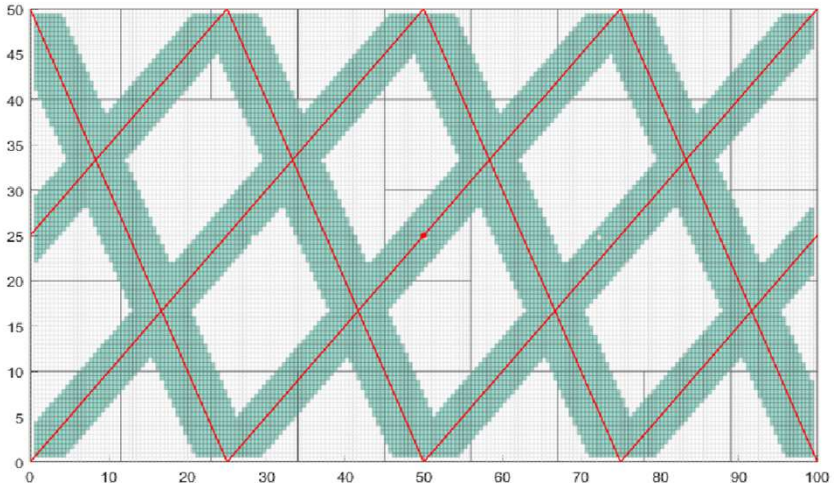
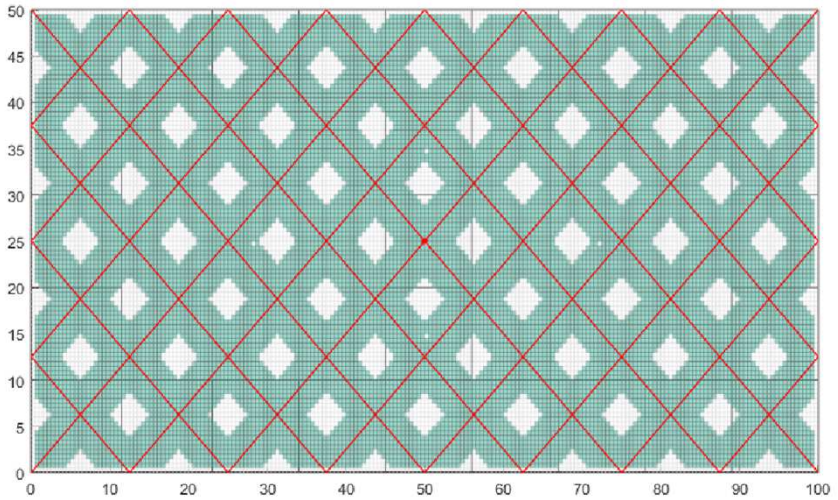


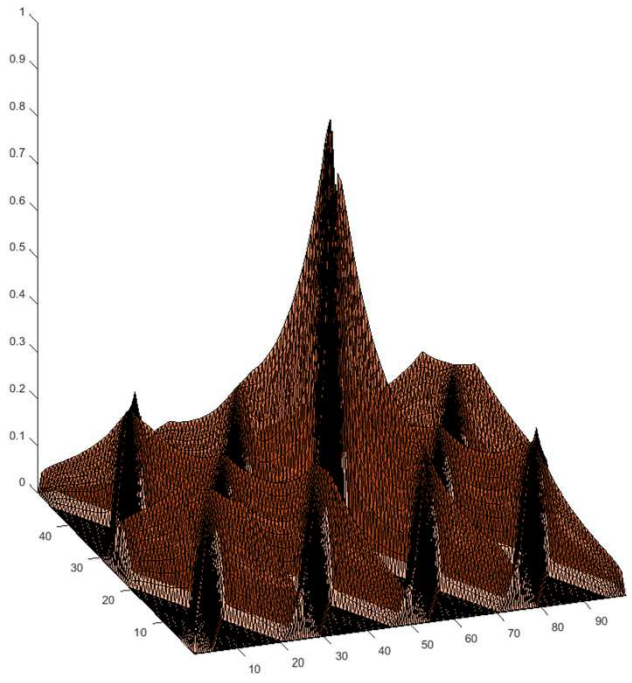
III



Basis Functions – Fracture

K_f = 1.2e3

I



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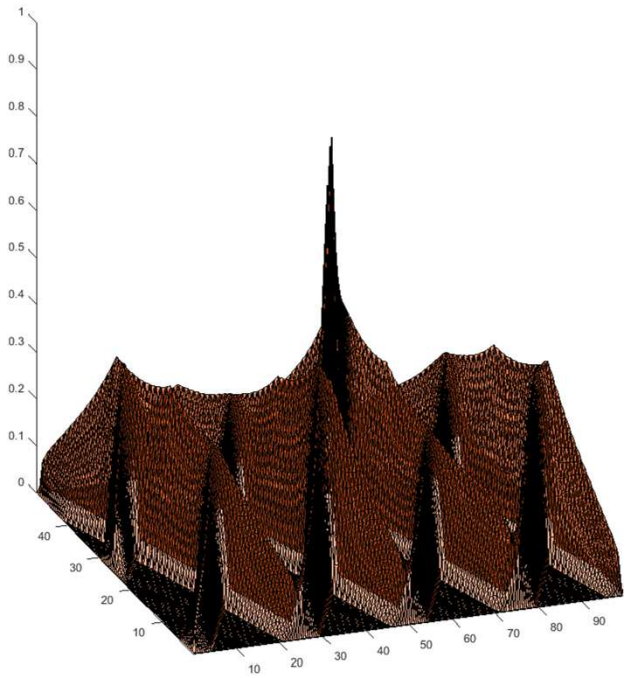
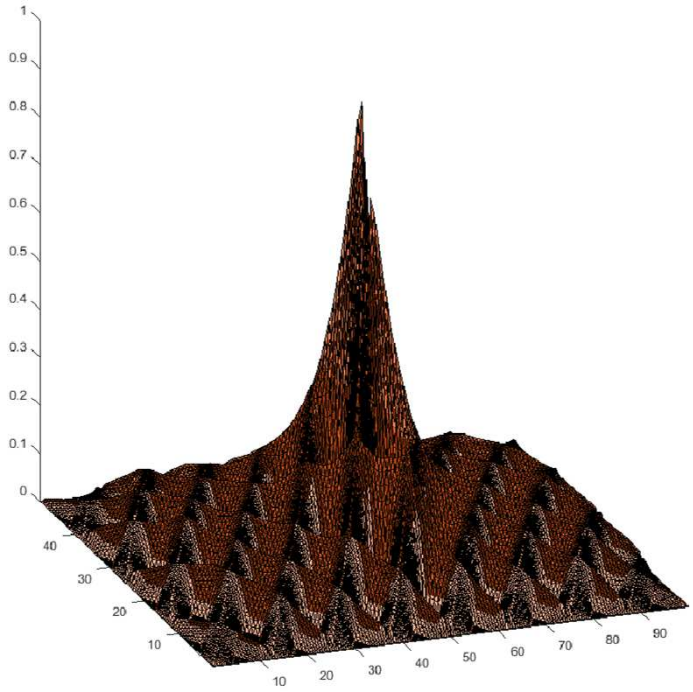


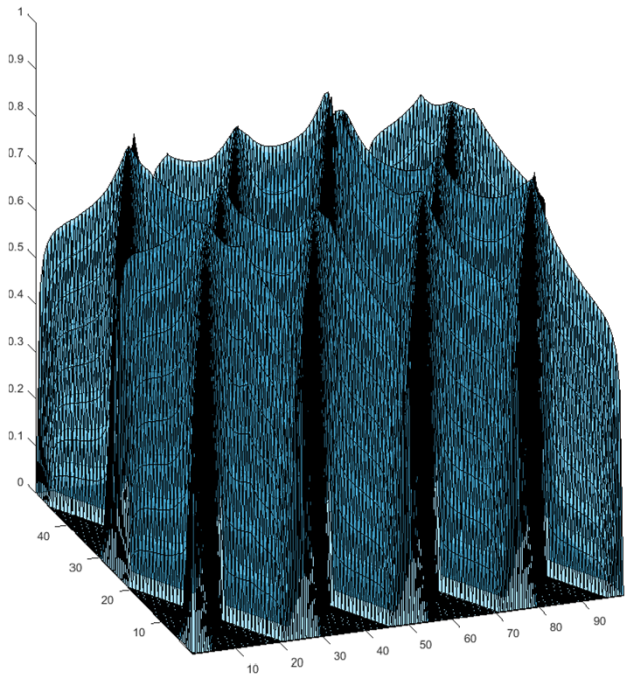
III



Basis Functions – Fracture

K_f = 1e4

I



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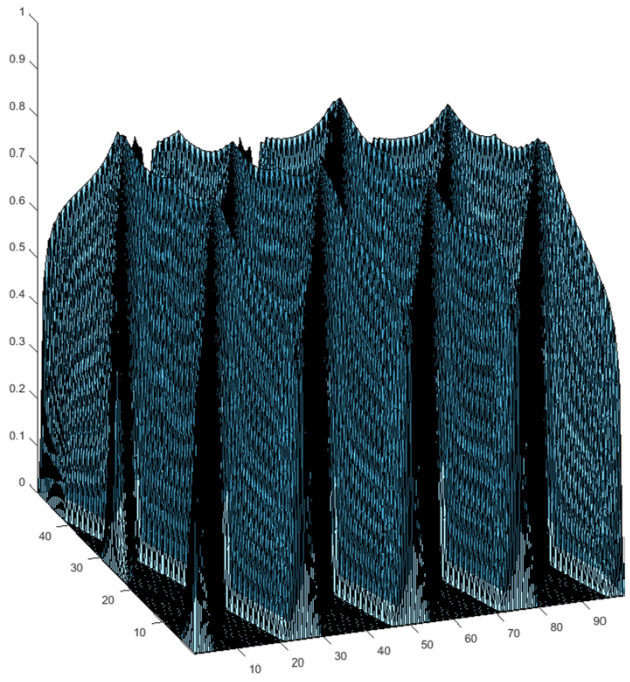

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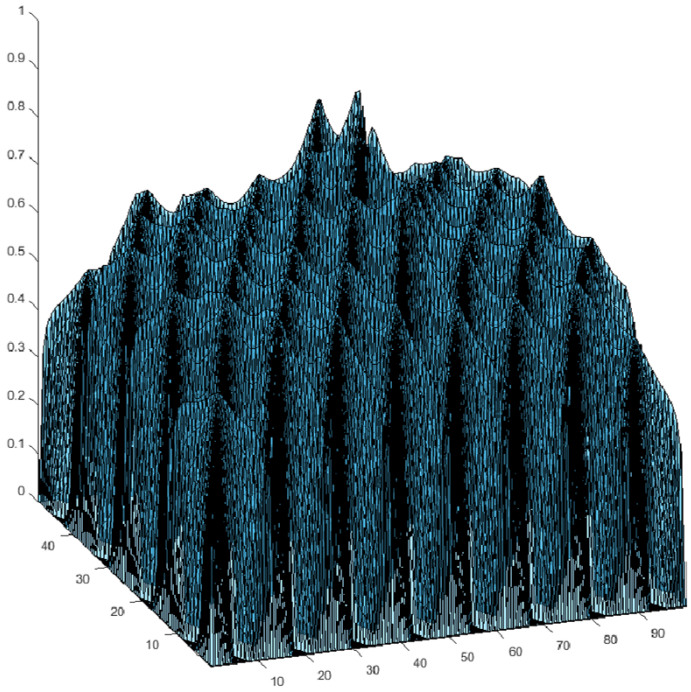
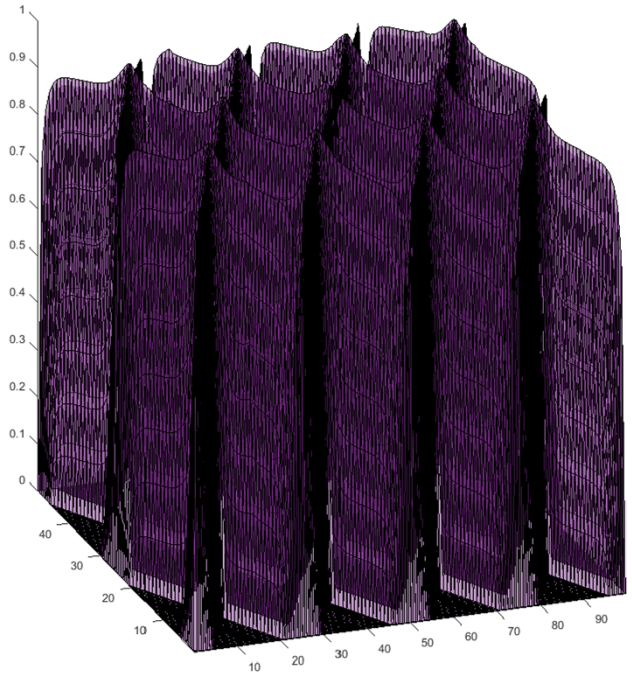


Basis Functions – Fracture

K_f = 1e5

I



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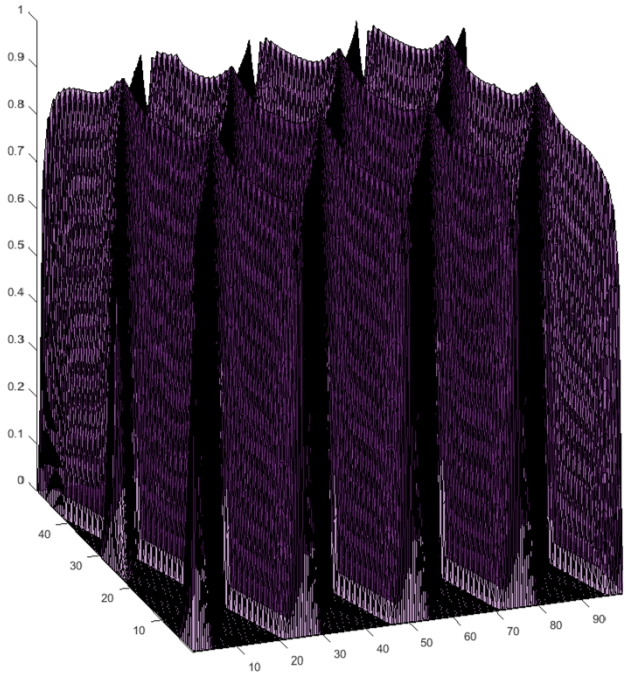

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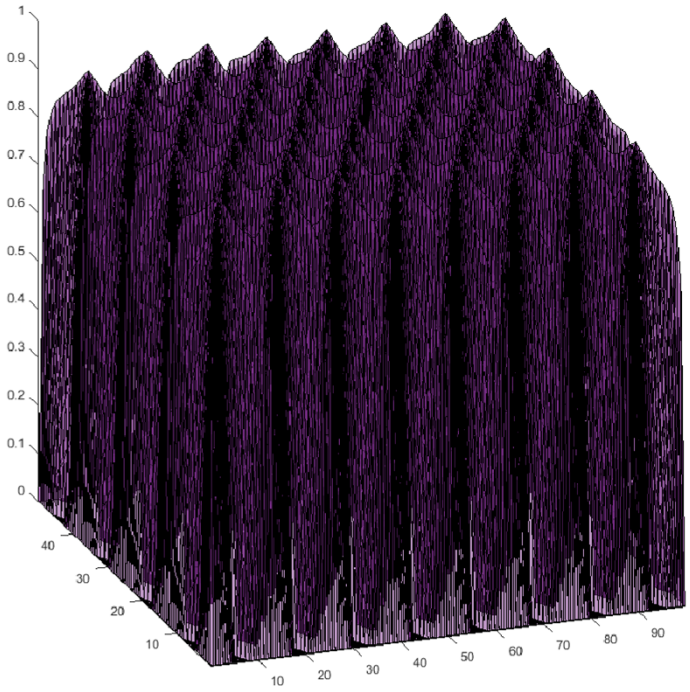
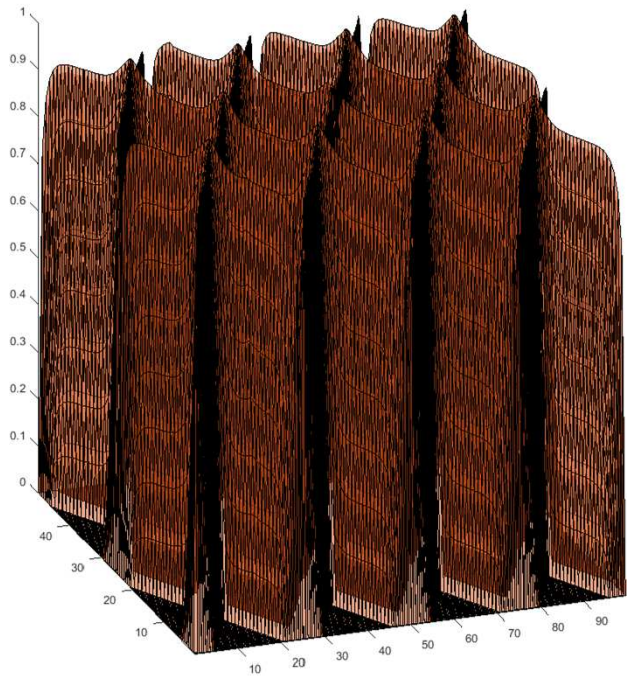


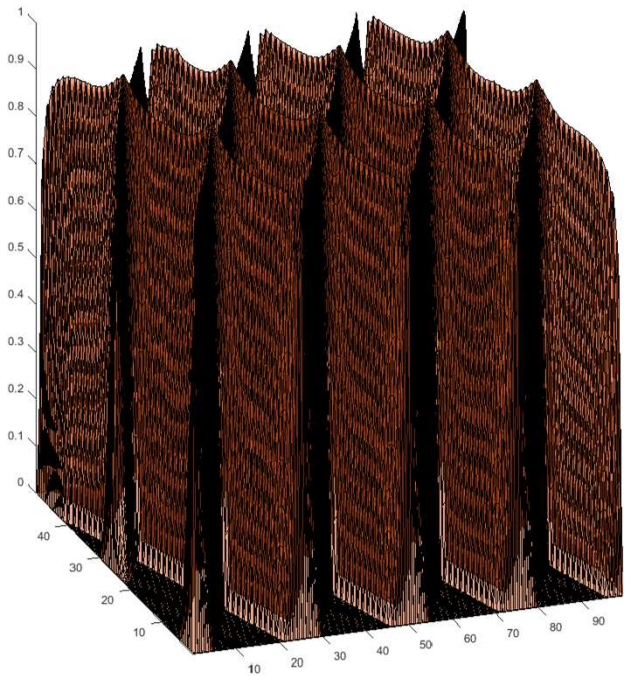
Basis Functions – Fracture

K_f = 1e6

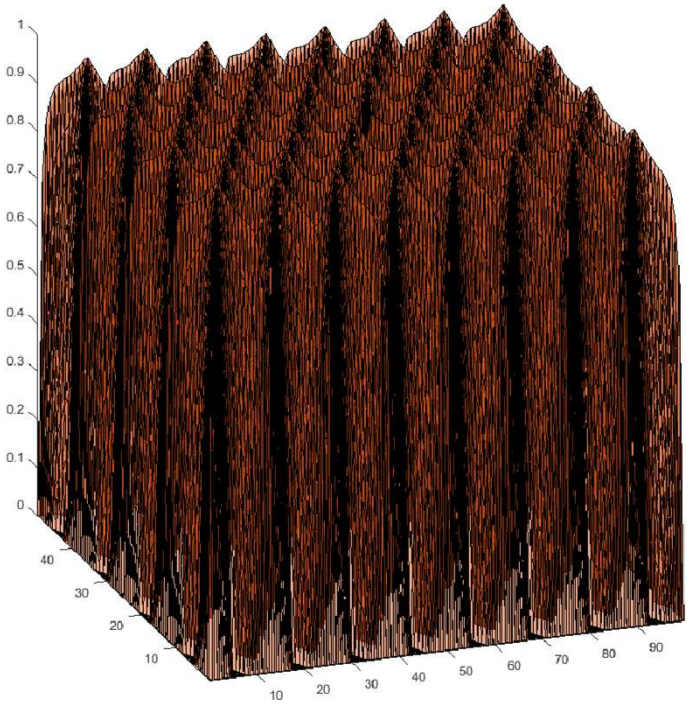
I



II



III



Basis Functions – Fracture (all fine grid cells in interaction region)