Note Title 3/19/2018

SPM (Full Physics) vs DPM (Transfer Function Term, PSS)

DPM:

- Coats | Kazemi
- M-F flow treatment : Darcy $TEX\,(P_M - P_F) = q_{MF}$

Diffusion $TEXD\,(C_{piM} - C_{piF})\,D_{pi}$

$\underbrace{TEX}_{N_m} = f(L_x\ L_y\ L_z,\ \underbrace{k_{mx}\ k_{my}\ k_{mz}}\ \phi_f,\ DELX, DELY, DELZ)$

$TEXD = f(L_x, L_y, L_z, \phi_m, T_{ort})$

- Assumption: (1) All grid-cell-to-grid-cell flow through fractures

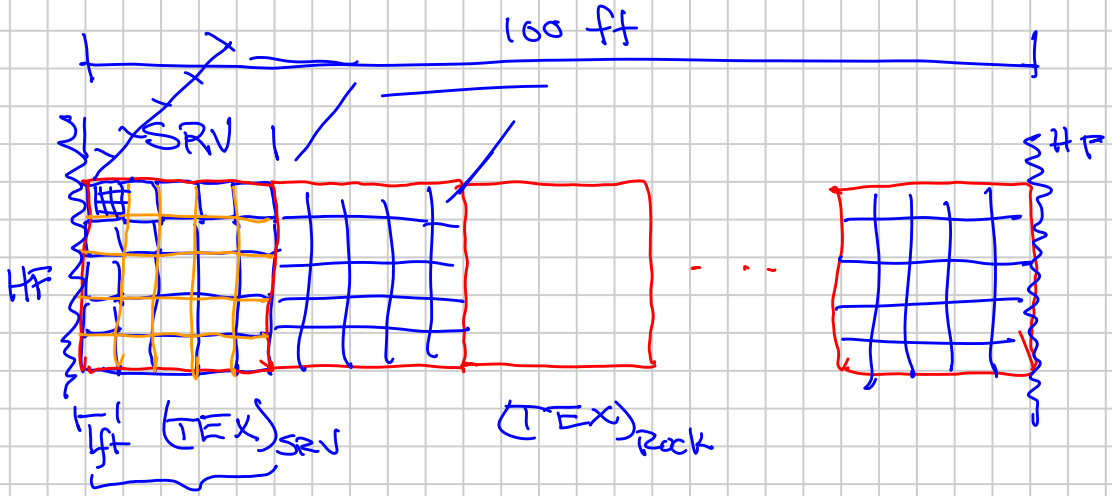
(2) All matrix blocks in a grid cell are identical

(3) $N_x L_x \simeq DELX$; $L_x \leq DELX$

$N_y L_y = DELY$; $L_y \leq DELY$

$N_z L_z = DELZ$; $L_z \leq DELZ$

Total $q_{MF} = \sum_m^{N_m} q_{MF,\ single\ matrix\ block}$



$L_x = L_y = L_z = 1$ ft

SPM : 25 x 20 cells = 500 cells

microfracs

$(k_m = 100\ md)_{Rock}$

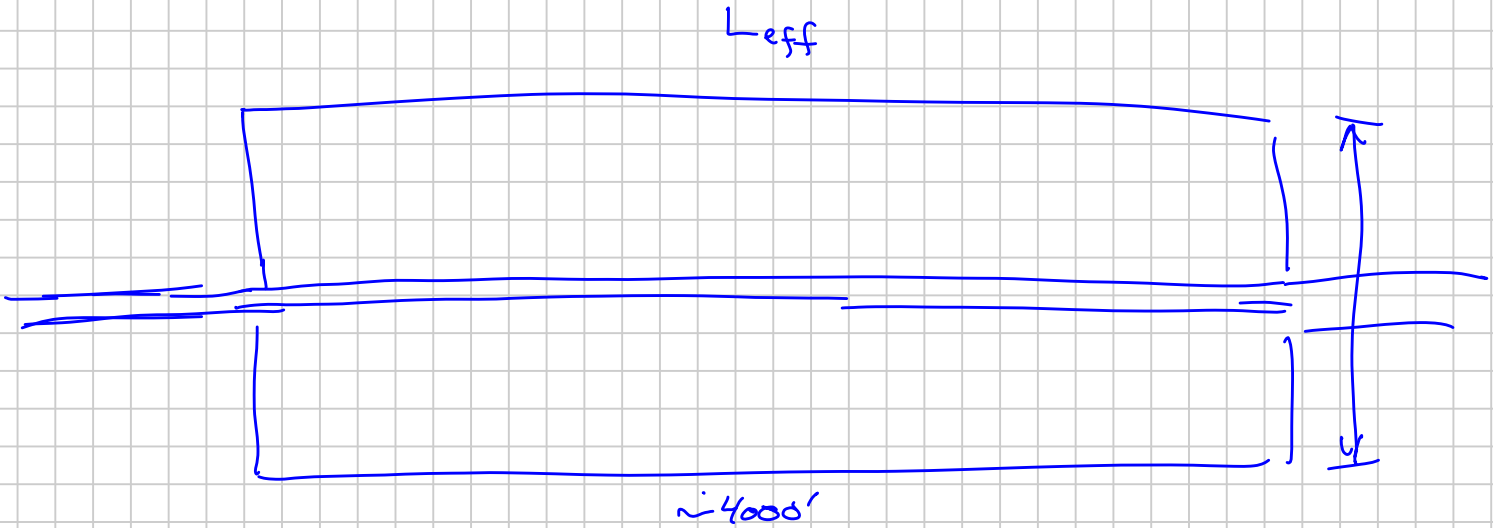
$k_m \sim 100$ md $(L_m = 1\ ft)_{SRV}$ $(L_m = 5\ ft)_{Rock}$

$k_{WT} \sim 0.01$ md $= 10^{4}$ nd

SPM: Match 2-wk BH Bakken Data ~

DPM: Match ~SPM & ~ Data

- unique
- multiple matches



$\bar{k}_m$
$\bar{L}_m$
SRV
1 5 20 ft

$\Rightarrow \bar{k}_{wi}$ + BU behavior

0.023md

Log-log
$\Delta p(\Delta t)$