05/23/25

Update rules for any m, but still for the special case when exchange between ALL DL happens for n directly below a MT and the two ns immediately to the left and to the right of it. ✓

- $$f_m(k+1) = \left[f_m(k) - \left(\frac{j_R - j_L}{\Delta r} \right) \Delta t \right]$$

$$+ a(m+1)\Delta r \Delta\theta \Delta t \left\{ \phi_{m,n}(k) + \phi_{m,n-1}(k) + \phi_{m,n+1}(k) \right\}$$

$$- b\, f_m(k)\Delta t$$

- $$\phi_{m,n}(k+1) = \phi_{m,n} - \frac{\Delta t}{(m+1)\Delta r}\left[(m+2)J_R^r - (m+1)J_L^r \right]$$

$$- \frac{\Delta t}{(m+1)\Delta r \Delta\theta}\left(J_R^\theta - J_L^\theta \right)$$

$$- a_{m,n}(k)\Delta t + \frac{1}{3}\frac{b\, f_m(k)\Delta t}{(m+1)\Delta r \Delta\theta}$$

This update rule holds for
$$n = n_{MT}, \quad n_{MT}+1 \text{ and } n_{MT}-1$$

For other n, the last two terms would be absent.

Also, js and Js are also functions of k (i.e. time step), just as fs and ϕs are.