The study of the observation operator of simplified extended Kalman filter (SEKF) in the SL-AV global medium-range weather forecast model

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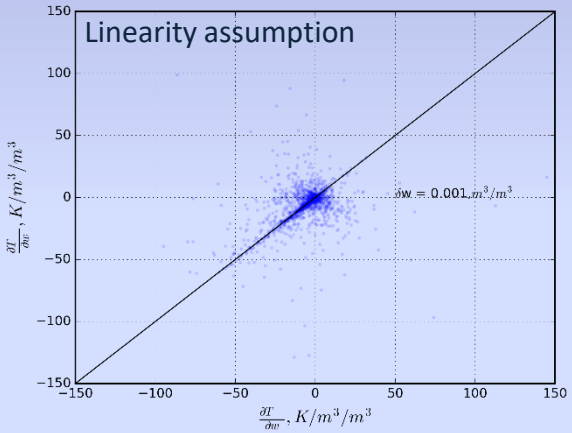
Using SEKF for correction of the deep soil moisture $\mathbf{w}$

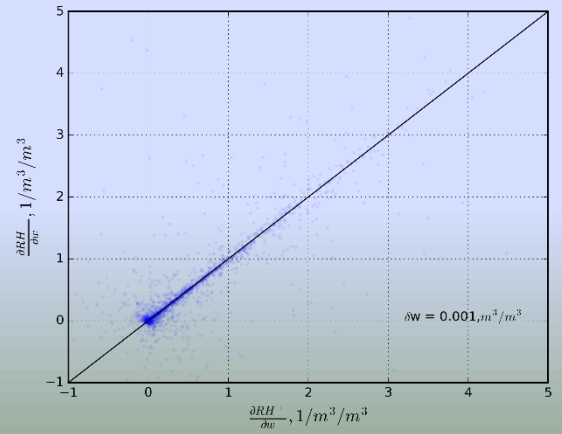
Analysis step

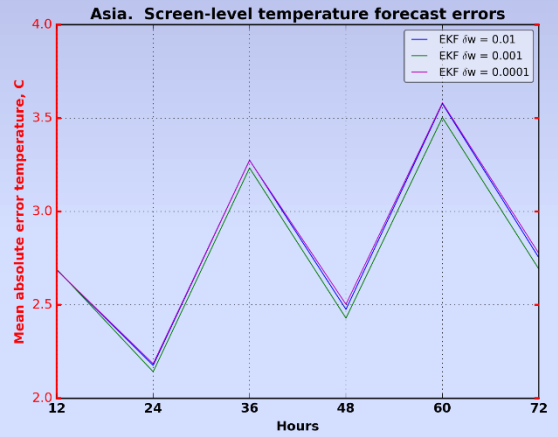
$$\mathbf{w}^a_{t-1} = \mathbf{w}^b_{t-1} + \mathbf{K}_{t-1}\left[\mathbf{y}^o_{t-1} - \mathbf{H}\left(\mathrm{w}^b_{t-1}\right)\right]$$

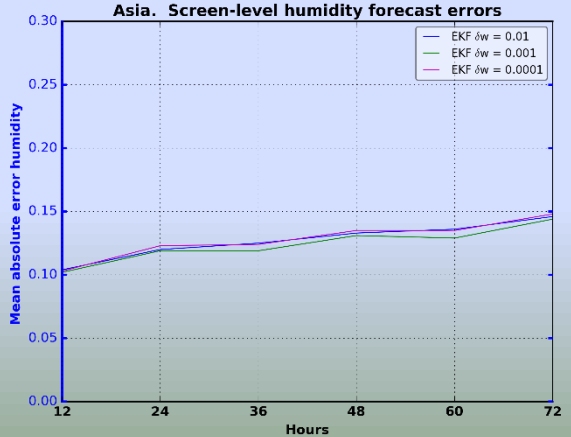
$$\mathbf{K}_{t-1} = \mathbf{B}\mathbf{H}^T\left(\mathbf{H}\mathbf{B}\mathbf{H}^T + \mathbf{R}\right)^{-1}$$

$$\mathbf{H}^T = \begin{pmatrix} \dfrac{T^{per}_{2M} - T_{2M}}{\delta w} \\ \dfrac{RH^{per}_{2M} - RH_{2M}}{\delta w} \end{pmatrix}$$







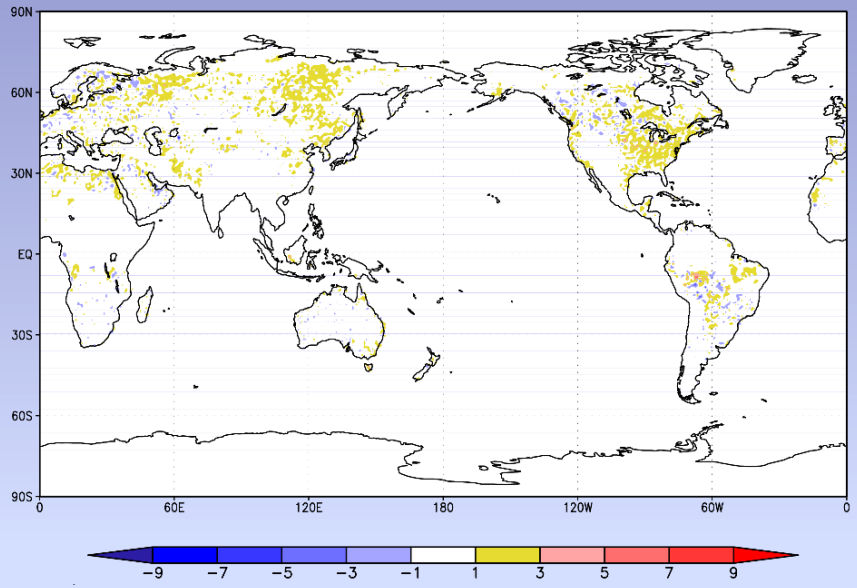


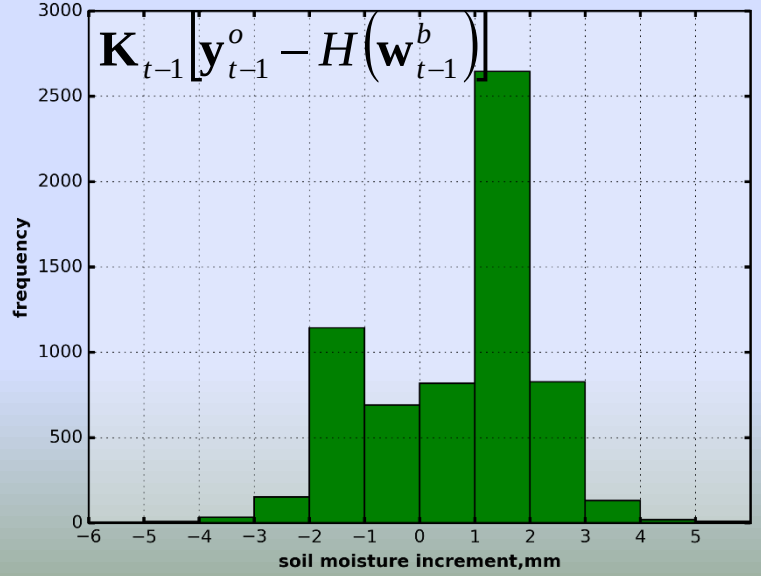
Forecast step

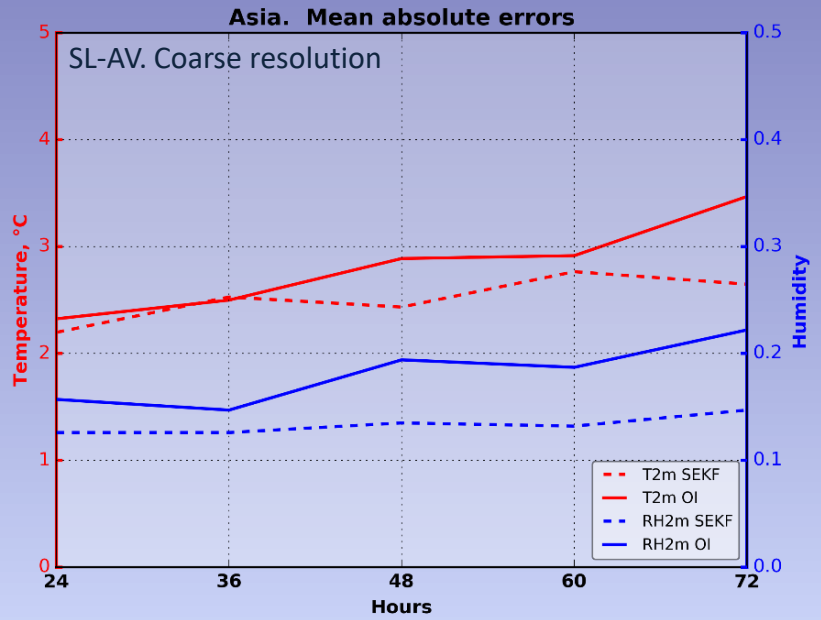
$$\mathbf{w}_t^b = M_{t-1}\left[\mathbf{w}_{t-1}^a\right]$$

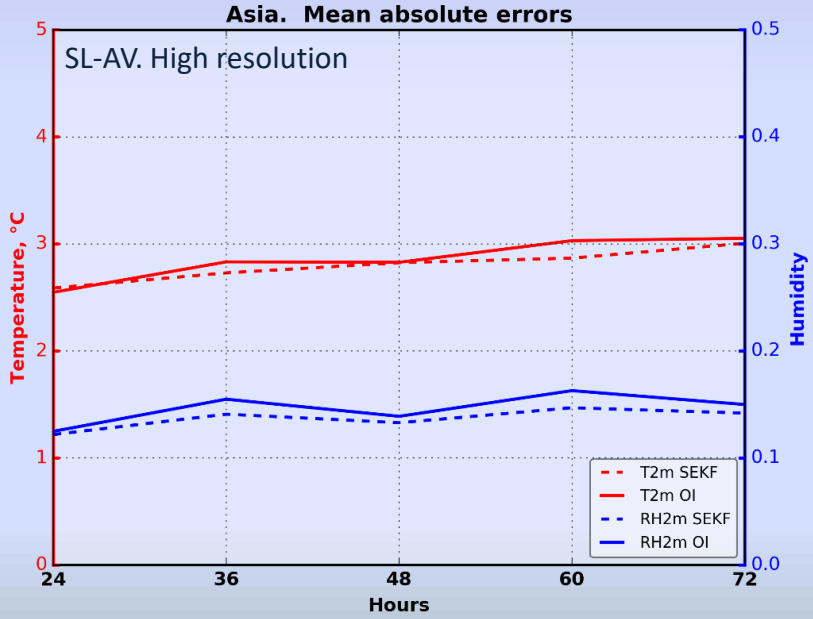
$$\delta\mathbf{w} = 0.001\, m^3/m^3$$

Analysis increment









See you at poster session!