Suggested Notation for Intensive Course on DA Methods (NCEO/ECMWF)

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H, h, or $\mathcal{H}$: non-linear observation operator
$\mathbf{H}$: tangent linear observation operator
M, m, or $\mathcal{M}$: non-linear model
$\mathbf{M}$: tangent linear model
N: size of ensemble
n: size of state space
$\mathbf{B}$, $\mathbf{P}_\mathrm{f}$, or $\mathbf{P}_\mathrm{b}$: a-priori/prior/forecast/background error covariance matrix
$\mathbf{P}_\mathrm{f}^{(N)}$: a-priori error covariance matrix formed from a sample of N
$\mathbf{C}_\mathrm{f}$: a-priori error correlation matrix
$\mathbf{A}$ or $\mathbf{P}_\mathrm{a}$: analysis/a-posterior error covariance matrix
p or m: number of observations
$\mathbf{Q}$: model error covariance matrix
$\mathbf{R}$: observation error covariance matrix
$\mathbf{x}_\mathrm{f}$ or $\mathbf{x}_\mathrm{b}$: a-priori/prior/forecast/background state vector
$\mathbf{x}_\mathrm{f}'$ or $\delta\mathbf{x}_\mathrm{f}$: perturbation or error of the a-priori/prior/forecast/background state vector
$\mathbf{x}_\mathrm{a}$: analysis/posterior state vector
$\mathbf{x}_\mathrm{a}'$ or $\delta\mathbf{x}_\mathrm{a}$: perturbation or error of the analysis state vector
$\boldsymbol{\eta}$: model error vector
$\boldsymbol{\Omega}$ or $\mathbf{C}_\mathrm{loc}$: localization/moderation matrix
$\mathbf{K}$: gain matrix
$\mathbf{X}$: matrix of ensemble members (forecast or analysis depending on super or subscript)
$\mathbf{X}'$: matrix of ensemble perturbations (forecast or analysis depending on super or subscript)
$\boldsymbol{\epsilon}$: random error (in observation, background, etc)
$\boldsymbol{\Sigma}_\mathrm{b}$: background error standard deviation matrix
$\mathbf{U}$, $\mathbf{L}$, or $\mathbf{B}^{1/2}$: control variable transform
$\boldsymbol{\chi}$, $\delta\boldsymbol{\chi}$, or $\mathbf{v}$: control variable

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