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Glossary of Symbols

iff := if and only if;

$\mathbb{N}$ set of positive integers, $\mathbb{R}^m$ set of real m-tuples, $\mathbb{C}^m$ set of complex m-tuples, $\mathbb{N}_0 = \mathbb{N} \cup \{0\}$, $\mathbb{R}^+ = \{x \in \mathbb{R}, x > 0\}$, $\overline{\mathbb{C}} = \mathbb{C} \cup \{\infty\}$;

$(a, b] = \{x \in \mathbb{R}, a < x \leq b\}$,

$X \oplus Y = \{x + y, x \in X, y \in Y \text{ when } X \cap Y = \emptyset\}$;

$\overset{\circ}{S}$ interior of the set $S \subset \mathbb{C}$, $\overline{S}$ closed hull of S, ∂S boundary of S, $\mathbb{C} \setminus S$ complement of S in $\mathbb{C}$;

$\Theta = \partial/\partial t$, τ: $y(t) \to y(t + \Delta t)$ shift operator;

$\mathrm{Re}\eta$ (or $\mathrm{Re}(\eta)$) real part of $\eta \in \mathbb{C}$, $\mathrm{Im}\eta$ imaginary part of $\eta \in \mathbb{C}$, $\arg(re^{i\phi}) = \phi$, $r > 0$, $0 \leq \phi < 2\pi$, $[\eta]$ largest integer not greater than $\eta \in \mathbb{R}$, $\mathrm{sgn}(\eta)$ sign of $\eta \in \mathbb{R}$;

$\deg(\sigma(\eta))$ degree of the polynomial $\sigma(\eta)$;

$\|x\|$ arbitrary vector norm, $\|x\|_p = (\sum_{\mu=1}^m |x_\mu|^p)^{1/p}$, $1 \leq p \leq \infty$, $|x| = \|x\|_2$, $x \in \mathbb{C}^m$;

$\|A\| = \max_{\|x\|=1} \|Ax\|$, Sp(A) set of the eigenvalues of A, spr(A) spectral radius of A, det(A) determinant of A, $\mathrm{Re}(A) = (A + A^H)/2$, A (m,m)-matrix;

the superscript T stands for 'transpose', the superscript H stands for 'conjugate transpose';

$P \geq Q \Leftrightarrow x^H(P - Q)x \geq 0 \ \forall x \in \mathbb{C}^m \Leftrightarrow \mathrm{Re}(P - Q)$ positiv semidefinit, P,Q (m,m)-matrices;

$C^p(\mathbb{R};\mathbb{R}^m)$ set of p-times continuously differentiable functions $f: \mathbb{R} \to \mathbb{R}^m$,

$|||f|||_n = \max_{0 \leq t \leq n\Delta t} |f(t)|$, $f: \mathbb{R} \to \mathbb{R}^m$, $n \in \mathbb{N}$, $\Delta t > 0$;

For symbols used only in Chapter VI see Section 6.1.