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# Symbol Index

Symbol	Description and page number(s)
$\mathcal{A}$	algebra of differential functions 288
$\mathcal{A}^m$	space of $m$ -tuples of differential functions 288
$\text{Ad}$	adjoint representation 199
$\text{Ad}^*$	co-adjoint representation 406
$\text{ad } \mathbf{v}$	adjoint vector field 200
$\text{ad}^* \mathbf{v}$	co-adjoint vector field 406
$\text{Ai}$	Airy function 209
$\mathbf{B}$	Poisson map on cotangent space 399
$\text{Bi}$	Airy function 209
$C$	distinguished function 392, 410
$\mathcal{C}$	distinguished functional 446
$\mathcal{C}$	formal conservation law 349
$C^k$	space of $k$ -times differentiable functions 4
$C^\infty$	space of smooth functions 4
$c_{jk}^i$	structure constant 50
$\text{cn}$	Jacobi elliptic function 194
$\text{Curl}$	total curl 265
$d$	differential 32, 54, 57
$\hat{d}$	vertical differential 353
$\mathbf{d}$	dilatational vector field 124
$\mathbf{D}$	total differential 351, 369
$\mathcal{D}$	dilatational symmetry operator 306
$\mathcal{D}$	differential operator 168, 308, 318
$\mathcal{D}$	Hamiltonian operator 435
$\mathcal{D}^*$	adjoint differential operator 328, 329
$\mathcal{D}$	pseudo-differential operator 319
$\mathcal{D}$	formal symmetry 323, 349
$\mathcal{D}^{-1}$	inverse of pseudo-differential operator 320
$\sqrt[n]{\mathcal{D}}$	$n$ -th root of pseudo-differential operator 321
$\mathcal{D}^{i/n}$	fractional power of pseudo-differential operator 321

- $D_i$  or  $D_x$   
 $D_x^{-1}$   
 $D_J$   
 $(-D)_J$   
 $D_p$   
 $D_p^*$   
 $D_x \zeta$   
 $D(\eta^1, \dots, \eta^p)/D(x^1, \dots, x^p)$   
 $dx^i$   
 $dx^i_j$   
 $dx^{\hat{i}j}$   
 $dx^J$   
 $du^j_z$   
 $\det$   
 $\operatorname{div}$   
 $\operatorname{Div}$   
 $e$   
 $E$   
 $E_x$   
 $E_x^J$   
 $E^{(k)}$   
 $E(m)$   
 $e^{\varepsilon A}$   
 $\operatorname{erf}$   
 $\exp$   
 $\exp(\varepsilon v)$   
 $\exp(\varepsilon v)$   
 $\exp(\varepsilon v_Q)$   
 $\mathcal{F}$   
 $G$   
 $G^+$   
 $g$   
 $g^*$   
 $G_c$   
 $G^{(r)}$   
 $g^{(r)}$   
 $G_x$   
 $G^x$   
 $g^x$   
 $G^x$   
 $G_x$   
 $g_a$   
 $g \cdot f$   
 $G/H$   
 $\operatorname{GL}(n)$  or  $\operatorname{GL}(n, \mathbb{R})$   
 $\operatorname{GL}^+(n)$   
 $\operatorname{gl}(n)$   
 $\operatorname{GL}(m, n)$   
 $\operatorname{Grass}(m, n)$   
 $\operatorname{Grass}(p, M)$   
 $h$   
 $\hbar$   
 $\hat{h}$   
 $H$   
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- $\mathcal{H}$
- $\mathcal{H}$
- $\mathbb{H}^m$
- $\mathcal{H}|_x$
- $\text{He}_n$
- $i$
- $I$
- $I$
- $I^{(n)}$
- $\tilde{I}^{(n)}$
- $I_\star^{(n)}$
- $l_Q$
- $l_u$
- $i_x$
- $\mathcal{I}_x$
- $J$
- $\tilde{J}$
- $J!$  or  $\tilde{J}!$
- $J$  or  $J_\Delta$
- $J^i$
- $K$
- $K_g$
- $\mathcal{K}|_x$
- $\mathcal{L}[u] = \int L \, dx$
- $m$
- $\mathbf{m}$
- $M$
- $M$
- $M$
- $M$
- $\mathcal{M}$
- $M_g$
- $M_x$
- $M^{(n)}$
- $M_\star^{(n)}$
- $M_{n \times n}$
- $M/G$
- $(M/G)^{(n)}$
- $\widetilde{(M/G)}^{(n)}$
- $(M/G)_\star^{(n)}$
- mod
- $\mathcal{O}$
- $O(n)$
- $O(\varepsilon^n)$
- order
- $P$
- $p_k$
- $p^{(n)}$
- $\text{pr}^{(n)} f$
- $\text{pr}^{(n)} g$
- $\text{pr}^{(n)} G$
- $\text{pr}^{(n)} \mathbf{v}$
- $\text{pr } \mathbf{v}$
- $\text{pr } \mathbf{v}_Q$
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- $\text{pr } v_Q(\mathcal{Q})$   
 $\text{pr}^{(n)} \Gamma$   
 $\bar{Q}$  or  $Q_\alpha$   
 $\bar{Q}$  or  $\bar{Q}_\alpha$   
 $\mathbb{Q}$   
 $\mathcal{R}$   
 $\mathcal{R}$   
 $\mathbf{R}$   
 $\mathbb{R}$   
 $\mathbb{R}^+$   
 $R_\theta$   
 $\mathbb{R}^m$   
 $r_{xy}$   
 $\mathcal{R}_{xy}$   
 $\mathbb{RP}^m$   
 $\mathcal{S}_F$   
 $S^m$   
 $\mathcal{S}_\alpha$   
 $\mathcal{S}_\Delta$   
 $\mathcal{S}_\Delta^*$   
  
 $\mathcal{S}_{\Delta/G}$   
 $\mathcal{S}_{\Delta/G}^*$   
 $\text{SL}(n)$  or  $\text{SL}(n, \mathbb{R})$   
 $\mathfrak{sl}(n)$   
 $\text{sn}$   
 $\text{SO}(n)$   
 $\mathfrak{so}(n)$   
 $\text{SO}(p, q)$   
 $\text{Sp}(n)$   
 $T$   
 $T_0$   
 $T^m$   
 $T(n)$   
 $TM$   
 $TM|_x$   
 $T^*M$   
 $T^*M|_x$   
 $u$  or  $u^\alpha$   
 $[u]$   
 $\mathcal{U}$   
 $U$   
 $U$   
 $u_i$   
 $u_i$   
 $U_n$   
 $u^{(n)}$   
 $U^{(n)}$   
 $U_z$   
 $U_\alpha$   
 $u_i^\alpha$   
 $u_j^\alpha$   
 $u_{j,i}^\alpha$   
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- $u_{mt,j}^a$   
 $V$   
 $V$   
 $v$   
 $v$   
 $v^*$   
 $v_0$   
 $v_{\mathcal{D}\theta}$   
 $v(f)$   
 $v(\omega)$   
 $\hat{v}_H$   
 $\hat{v}_{\mathcal{X}^n}$   
 $\tilde{\gamma}^{(n)}$   
 $\tilde{\gamma}^{(n)}$   
 $v_Q$   
 $v_Q[\mathcal{D}]$   
 $v_u$   
 $v|_x$   
 $v_a$   
 $v_a$   
 $(\mathcal{V}/G)^{(n)}$   
 $(\mathcal{V}/G)^{(n)}$   
 $\text{Vol}$   
 $W$   
 $x$   
 $x$  or  $x^i$   
 $\hat{x}$   
 $X$   
 $x^j$   
 $\mathbb{Z}$   
 $1$  or  $1_x$   
 $(-1)^\pi$   
 $\Gamma_f$   
 $\Gamma^{(n)}$   
 $\delta$   
 $\delta$   
 $\delta_a$  or  $\delta/\delta u^a$   
 $\delta_j^i$   
 $\Delta$   
 $\Delta$   
 $\Delta$   
 $\Delta/G$   
 $\Delta^{(k)}$   
 $\Delta(x, u^{(n)}) = 0$   
 $\ominus$   
 $\theta_f^a$   
 $\kappa$   
 $\xi^i$   
 $\pi$   
 $\pi$   
 $\pi^k$   
 $\pi^{(n)}$   
 $\pi_k^n$   
 $\phi_\alpha$   
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