

# Notation index

## Abbreviations

d.f.	distribution function	
i.i.d.	independent and identically distributed	
p.d.f.	probability density function	
lu	length unit	6
mse	mean squared error	480
$\hat{\cdot}$	‘hat’, denotes an estimator; for example, $\hat{\theta}$ is an estimator of the parameter $\theta$ .	

## Frequently used symbols

$b_d$	volume of unit sphere in $\mathbb{R}^d$	
$b(x, r)$	sphere (disc) of radius $r$ centred at $x$	
$CE$	Clark–Evans index	196
$d(r)$	p.d.f. for $D(r)$	207
$d(x)$	distance from point $x$ to its nearest neighbour	177
$D(r)$	nearest-neighbour distance d.f.	206
$D_{\text{fin}}(r)$	finite nearest-neighbour distance d.f.	126
$\mathbf{E}$	expectation	
$\mathbf{E}_o$	expectation with respect to Palm distribution	178
$f_{\mathcal{M}}(m)$	p.d.f. for $F_{\mathcal{M}}(m)$	302
$f_n(x_1, \dots, x_n)$	location density function	103
$F_{\mathcal{M}}(m)$	mark d.f.	300
$g(r)$	pair correlation function	218
$g_{ij}(r)$	partial pair correlation function	325
$G(t)$	point density d.f.	29
$h$	bandwidth	230, 482
$h_s(r)$	p.d.f. for $H_s(r)$	201
$H_s(r)$	spherical contact d.f.	200

$I$	dispersion index	87
$J(r)$	$J$ -function	213
$k(r)$	covariance function; kernel function	367, 384; 230, 481
$k_{mm}(r)$	mark correlation function	341
$k_m(r)$	$r$ -mark correlation function	346
$K(r)$	Ripley's $K$ -function	215
$K_{\text{fin}}(r)$	finite $K$ -function	129
$K_{ij}(r)$	multivariate $K$ -function	323
$K_{mm}(r)$	mark-weighted $K$ -function	350
$\mathcal{K}(B)$	second-order moment measure	223
$L(r)$	$L$ -function	216
$L_{ij}(r)$	multivariate $L$ -function	325
$L_{mm}(r)$	mark-weighted $L$ -function	352
$m(x_n), m(x_i)$	mark of point $x_n, x_i$	299
$m_D$	mean distance to nearest neighbour, $= \mathbf{E}_o(d(o))$	207
$M$	marked point process	33, 299
$\overline{M}_k$	mingling index using $k$ neighbours	314
$N$	point process	23
$\mathbf{n}_{mm}$	nearest-neighbour mark product index	317
$\mathbf{n}_\gamma$	nearest-neighbour variogram index	317
$n_i(r), n_x(r)$	number of points within distance $r$ from $x_i, x$	177, 182
$N(A), N(B)$	number of points of $N$ in $A, B$	24
$o$	origin of space $\mathbb{R}^d$	
$p(\{x_1, \dots, x_n\})$	p.d.f. with respect to Poisson process distribution	148
$p_{ij}(r)$	mark connection function	331
$\mathbf{P}$	probability	
$\mathbf{P}_o$	probability with respect to Palm distribution	178
$r$	distance variable	
$\mathbb{R}$	real line	
$\mathbb{R}^d$	$d$ -dimensional Euclidean space	
$r_{\text{max}}$	range of interaction of Gibbs processes	140
$r_0$	hard-core distance, minimum inter-point distance	207
$r_1, r_2, r_3$	distinctive points of the pair correlation function	240
$\overline{R}_k$	mean-direction index	197
$W$	observation window	
$W_{\ominus r}, W_{\ominus d(x)}$	reduced window	186, 187
$x, x_i, x_n$	points	
$X_r$	set of discs around the points of $N$	43
$Z, Z_n, Z_n(\theta)$	configurational partition function	148, 140, 161
$\alpha$	error probability; chemical activity self-potential	54, 148, 399
$\alpha^{(k)}$	$k$ th factorial moment measure	31
$\overline{\gamma}_W(r)$	isotropised set covariance	485
$\hat{\kappa}_{st}(r)$	estimator of $\lambda K(r)$ assuming stationarity	228

$\lambda$	intensity	37, 174
$\lambda_i$	intensity of sub-point process of points with mark $i$	300
$\hat{\lambda}_{nn}$	nearest-neighbour intensity estimator	194
$\lambda_S$	mark-sum intensity	304
$\lambda(x), \lambda(r)$	intensity function	28, 110, 113
$\lambda(x M)$	Papangelou conditional intensity function	28
$\mu$	mean mark	302
$\mu^{(k)}$	$k$ th moment measure	31
$\nu(A), \nu(W)$	area of $A, W$ , volume of $A, W$ , $d$ -dimensional volume of $A, W$	
$\varrho(r)$	second-order product density in stationary and isotropic case	33
$\varrho^{(k)}$	$k$ th product density	32
$\sum^{\neq}$	sum over point pairs or $k$ -tuples of distinct points	32
$\sigma_{\mu}^2$	variance of marks	302
$\phi(r)$	pair potential of Gibbs process	140, 399
$\mathbf{1}_A(x)$	indicator function	26
$\square$	unit square, cube, or cube in $\mathbb{R}^d$	
$\ \cdot\ $	norm; $\ x\ $ = distance from $x$ to $o$ , $\ x - y\ $ = distance from $x$ to $y$	
$\oplus$	Minkowski addition	483

