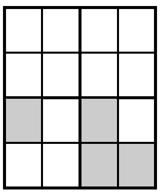
Appendix

Table 1 Collection of representative classes of macrostates* and their associated i) entropies, ii) entropic descriptor C_λ and iii) the relative form $C_\lambda/C_{\lambda,max}$, for a toy model: (A) N = 4, (B) N = 7 and (C) N = 8, where the black pixels are placed on a 4 × 4 lattice partitioned into λ= 4 (not overlapping) cells at length scale k = 2. The maximal values of the relative complexity are given in boldfaced form. The last columns include also results of a C_λ(SCS)-calculation (with the sliding cell-sampling approach) for the specific representative configurations given below.

Case	Macrost. #	Config.	S_{min}	S	S_{max}	C_λ	$C_\lambda/C_{\lambda,max}$	C_λ(SCS)
A	1	1 1 1 1		5.5452	5.5452	0.0	0.0	
A	2	0 1 1 2		4.5643		0.2018	0.5823	
A	3	0 0 2 2		3.5835		0.3169	0.9144	
A	4	0 0 1 3		2.7726		0.3466	**1.0**	0.2759
A	5	0 0 0 4	0.0	0.0		0.0	0.0	
B	1	1 2 2 2		6.7616	6.7616	0.0	0.0	
B	2	0 2 2 3		4.9698		0.2986	0.8889	
B	3	0 1 3 3		4.1589		0.3356	**0.9989**	0.2940
B	4	1 1 1 4		4.1589		0.3356	**0.9989**	0.2947
B	5	0 1 2 4		3.1781		0.2986	0.8889	
B	6	0 0 3 4	1.3863	1.3863		0.0	0.0	
C	1	2 2 2 2		7.1670	7.1670	0.0	0.0	
C	2	1 2 2 3		6.3561		0.1798	0.4014	
C	3	1 1 3 3		5.5452		0.3137	0.7003	
C	4	0 2 3 3		4.5643		0.4144	0.9251	
C	5	1 1 2 4		4.5643		0.4144	0.9251	
C	6	0 2 2 4		3.5835		0.4479	**1.0**	0.3386
C	7	0 1 3 4		2.7726		0.4250	0.9553	
C	8	0 0 4 4	0.0	0.0		0.0	0.0	

* e.g., for A#4 the notation 0013 denotes representative macrostate realized by

$\binom{4}{0}\binom{4}{0}\binom{4}{1}\binom{4}{3}$ = 16 configurational microstates, one of them being $\Rightarrow$

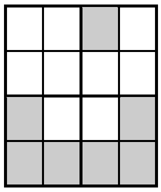


This macrostate exhibits the highest value of C_λ = 0.3466 for case (A).

For the above specific representative configuration one can create the corresponding macrostate (using SCS-tenets), i.e., 000111123, having 96 realizations. Thus, the value of the entropic descriptor will be C_λ(SCS) = 0.2759.

For B#3, i.e., for the 0133 representative macrostate one obtains

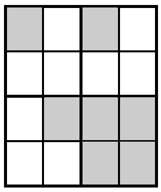
$\binom{4}{0}\binom{4}{1}\binom{4}{3}\binom{4}{3}$ = 64 configurational microstates, one of them being ⇒



This macrostate and the one given below exhibit the highest possible value C_λ = 0.3356 for case (B) while for the corresponding macrostate 011101323 (SCS used again), one finds C_λ(SCS) = 0.2940.

The associated degenerate B#4, i.e., the 1114 macrostate is realized by

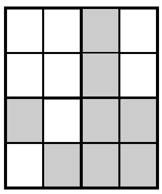
$\binom{4}{1}\binom{4}{1}\binom{4}{1}\binom{4}{4}$ = 64 configurational microstates, one of them being ⇒



This macrostate shows the same as above highest value of C_λ = 0.3356. Using the SCS approach, i.e., for the corresponding macrostate 111122134 we obtain C_λ(SCS) = 0.2947, which differs from the previous one. This means that certain degenerations can be removed with SCS-help.

In turn, the C#6 case, i.e., the 0224 macrostate, is realized by

$\binom{4}{0}\binom{4}{2}\binom{4}{2}\binom{4}{4}$ = 36 configurational microstates, one of them being ⇒



This macrostate exhibits the highest possible value C_λ = 0.4479 for case (C) of this toy model with $1 \leq N \leq 16$ at length-scale k = 2. For the corresponding SCS-macrostate, i.e., 022123234 one finds C_λ(SCS) = 0.3386.