

Geometry of Quantum States

Ingemar Bengtsson and Karol Życzkowski

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Erratum,¹ July 17, 2020

- i)** page 4, Caption of Fig. 1.4, full body,
is: A convex body is homeomorphic to a sphere.
should be: A convex body is homeomorphic to a ball.
- ii)** p. 27, end of the first paragraph, shifted values of N :
is: For $N = 2$ it is a hexagon, for $N = 3$ a cuboctahedron,
should be: For $N = 3$ it is a hexagon, for $N = 4$ a cuboctahedron,
- iii)** p. 44, Caption of Fig. 2.9, misprint in vector
is: $Q = (0.6, 0.4, 0.1)$
should be: $Q = (0.6, 0.3, 0.1)$
- iv)** p. 49, Eq.(2.49):
In the normalization factor, the square root of curly N should be in the numerator, not in the denominator. This error occurs twice.
- v)** p. 79, Eq. (3.63)
is:
$$dJ = 2ig_{a\bar{b},c}dz^c \wedge mdz^a \wedge d\bar{z}^{\bar{b}} + 2ig_{a\bar{b},\bar{c}}d\bar{z}^{\bar{c}} \wedge dz^a \wedge d\bar{z}^{\bar{b}} = 0 ,$$

the letter m in the second $\wedge$ -factor of the first summand is redundant,
should read:
$$dJ = 2ig_{a\bar{b},c}dz^c \wedge dz^a \wedge d\bar{z}^{\bar{b}} + 2ig_{a\bar{b},\bar{c}}d\bar{z}^{\bar{c}} \wedge dz^a \wedge d\bar{z}^{\bar{b}} = 0 ,$$
- vi)** p. 135, Eq. (4.103), misprint $4 \rightarrow N$,
is: $\frac{SL(N,\mathbb{C})}{P_1^{(4)}}$
should be: $\frac{SL(N,\mathbb{C})}{P_1^{(N)}}$

¹We are grateful to Daniel Miller, the most eager reader of our book, who kindly informed us about the vast majority of the misprints listed below...

vii) p. 144, Eq. (5.13), eigenstates $|e_i\rangle$ should simply read $|i\rangle$, so this equation reads

$$|\psi\rangle = \sum_{i=1}^n \sqrt{p_i} e^{i\mu_i} |i\rangle, \quad |\phi\rangle = \sum_{i=1}^n \sqrt{q_i} e^{i\nu_i} |i\rangle. \quad (5.13)$$

viii) p. 176, Eq. (6.39), missing subscript (s) ,

in the integrand is: $\tilde{W}(u, v)$

should be: $\tilde{W}^{(s)}(u, v)$

ix) p. 182, Eq. (6.63), absolute value missing,

is: $0 \leq \langle J_z \rangle \leq j$

should be: $0 \leq |\langle J_z \rangle| \leq j$

x) p. 207, below Eq. (7.60),

is: where P_{2n} projects the space $N_{K,n} \otimes N_{K,n}$ into $N_{K,2n}$

should be: where P_{2n} projects the space of dimension $(N_{K,n})^2$ into $N_{K,2n}$ dimensions.

xi) p. 208, Eq. (7.66), change sine into cosine:

is: $2k \sin(\theta_k)(\sin \theta_k)^{2k-1}$

should be: $2k \cos(\theta_k)(\sin \theta_k)^{2k-1}$

xii) p. 208, above Eq. (7.69), misprint $p \rightarrow y$:

is: $P(p) = n(1 - y)^{n-1}$

should be: $P(y) = n(1 - y)^{n-1}$

xiii) p. 242, three sentences above Eq. (8.59), wrong label:

is: Looking at the planar projections of $\mathcal{M}^{(3)}$ shown in Figure 8.8

should be: Looking at the planar projections of $\mathcal{M}^{(3)}$ shown in Figure 8.9

xiv) p. 304, Eqs. (11.16), (11.17) and (11.18), curly brackets redundant,

(11.16) is: $\{\Phi \in \mathcal{CP}\}$, should be $\Phi \in \mathcal{CP}$

(11.17) is: $\{\Phi \in \mathcal{P}\}$, should be $\Phi \in \mathcal{P}$

(11.18) is: $\{\Phi \in \mathcal{SP}\}$, should be $\Phi \in \mathcal{SP}$

xv) p. 313, line 3 of first paragraph, space redundant:

is: a notion of strategic im portance in the theory of entanglement

should be: a notion of strategic importance in the theory of entanglement

xvi) p. 316, below Eq. (12.13), statement to be improved:

is: Another nice feature is that the phase factor ensures that all displacement operators are of order N .

should be: Another nice feature is that the phase factor ensures that all displacement operators raised to power N give identity.

xvii) p. 342 (very first line), typo

is: $A_{0,0}^2 = F$.

should be: $A_{0,0} = F^2$

xviii) p.381, slightly improved version of Fig. 13.5 is enclosed below,

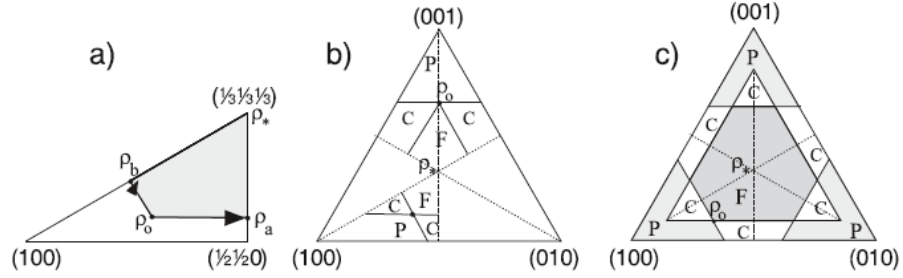


Figure 1: Figure 13.5 The eigenvalue simplex for $N = 3$: (a) a Weyl chamber; the shaded region is accessible from ρ_0 with bistochastic maps. (b) The shape of the light cone depends on the degeneracy of the spectrum. F denotes the future, P the past, and C the non-comparable states. (c) Splitting the simplex into Weyl chambers.

xix) p. 346, 11-th line after Eq. (12.98), one 't' is redundant

is: that tthe $N(N+1)$

should be: that the $N(N+1)$

xx) p. 347, formula (12.100), number t in the exponent missing, in the sum on the left hand side is missing,

the sum is: $\sum_{I,J} |\text{Tr} U_I^\dagger U_J|^2$

should be: $\sum_{I,J} |\text{Tr} U_I^\dagger U_J|^{2t}$

xxi) p. 422, the very first line, redundant letter b ,

is: complex random pure state on NKb dimensional Hilbert space,

should be: complex random pure state on NK dimensional Hilbert space,

xxii) p.444, Eq. (16.28), change $|\Omega\rangle \rightarrow |\Psi\rangle_{23}$

left hand side, is: $|\Psi\rangle_1 |\Omega\rangle_{23}$

should be: $|\Psi\rangle_1 |\Phi^+\rangle_{23}$

xxiii) p. 461, 4 lines below Eq. (16.61), font change $N \rightarrow N$

is: $\frac{1}{N} \text{Tr} \rho D_{\Phi} \geq 0$

should be: $\frac{1}{N} \text{Tr} \rho D_{\Phi} \geq 0$

xxiv) p. 472, Eq. (16.62) – (16.64), curly brackets redundant

(16.62) is: $\{\Phi \in \mathcal{SP}\}$, should be $\Phi \in \mathcal{SP}$

(16.63) is: $\{\Phi \in \mathcal{P}\}$, should be $\Phi \in \mathcal{P}$

(16.64) is: $\{\Phi \in \mathcal{CP}\}$, should be $\Phi \in \mathcal{CP}$

xxv) p. 472, Property (E6), a missing superscript “-”,

is: $E(|\psi\rangle\langle\psi^-|) = 1$

should be: $E(|\psi^-\rangle\langle\psi^-|) = 1$

xxvi) p. 490, Fig. 16.14. Labels at the entanglement axis E (vertical in gray)

are: ...0.4, 0.5, *v*.6

should be: ...0.4, 0.5, 0.6

xxvii) p. 505, third line, typo: $e \rightarrow h$,

is: Her Athens over which see ruled

should be: Her Athens over which she ruled

xxviii) p. 527, Eq. (17.74), second line, tex error. The equation should read:

$$\begin{aligned} |\Phi_2^5\rangle = & |00000\rangle + |11000\rangle + |01100\rangle + |00110\rangle + |00011\rangle + |10001\rangle - \\ & - |10010\rangle - |10100\rangle - |01001\rangle - |01010\rangle - |00101\rangle - \\ & - |11110\rangle - |11101\rangle - |11011\rangle - |10100\rangle - |01111\rangle . \end{aligned} \quad (17.74)$$

xxix) p. 528, line 2, wrong font used,

is: $K=4$

should be: $K = 4$

xxx) p. 576, reference [112], coma missing

is: CP^n , or entanglement illustrated,

should be: CP^n , or, entanglement illustrated,

xxxi) p. 579, reference [165], word ‘bounds’ should not be hyphenated

xxxii) p. 584, reference [299], wrong journal

should be: P. Erdős. On an elementary proof of some asymptotic formulas in the theory of partitions. *Annals of Mathematics* 43: 437, 1942.

xxxiii) p. 603, reference [765], wrong numbers

is: 87:05430

should be: 87:054301