# References


Abiad, A. and Haemers, W. H., (2012), "Cospectral graphs and regular orthogonal matrices of level 2", *the electronic journal of combinatorics,* Vol.19, No.3, pp.P13, 2012

Adhikari, B., Banerjee, S., Adhikari, S., and Kumar, A., (2017), "Laplacian matrices of weighted digraphs represented as quantum states", *Quantum information processing,* Vol.16, No.3, pp.79, 2017

Ali, M., Rau, A., and Alber, G., (2010), "Quantum discord for two-qubit X states", *Physical Review A,* Vol.81, No.4, pp.042105, 2010

Anders, S. and Briegel, H. J., (2006), "Fast simulation of stabilizer circuits using a graph-state representation", *Physical Review A,* Vol.73, No.2, pp.022334, 2006

Arveson, W., (2012), *An invitation to C*-algebras*, volume 39, Springer Science & Business Media, 2012

Atiyah, M. F., (1990), *The geometry and physics of knots*, Cambridge University Press, 1990

Bapat, R. B., (2010), *Graphs and matrices*, volume 27, Springer, 2010

Barnett, S., (2009), *Quantum information*, volume 16, Oxford University Press, 2009

Belhaj, A., Belhaj, A., Machkouri, L., Sedra, M. B., and Ziti, S., (2016), "Weighted Graph Theory Representation of Quantum Information Inspired by Lie Algebras", *arXiv preprint arXiv:1609.03534,*, 2016

Bell, John S,*On the einstein podolsky rosen paradox,*

Bennett, C. H., Bessette, F., Brassard, G., Salvail, L., and Smolin, J., (1992), "Experimental quantum cryptography", *Journal of cryptology,* Vol.5, No.1, pp.3–28, 1992

Bennett, C. H., Brassard, G., Crépeau, C., Jozsa, R., Peres, A., and Wootters, W. K., (1993), "Teleporting an unknown quantum state via dual classical and Einstein-Podolsky-Rosen channels", *Physical review letters,* Vol.70, No.13, pp.1895, 1993

Bennett, C. H., DiVincenzo, D. P., Mor, T., Shor, P. W., Smolin, J. A., and Terhal, B. M., (1999), "Unextendible product bases and bound entanglement", *Physical Review Letters,* Vol.82, No.26, pp.5385, 1999

Berkolaiko, G., (2016), "An elementary introduction to quantum graphs", *arXiv preprint arXiv:1603.07356,*, 2016

Berkolaiko, G. and Kuchment, P., (2013), *Introduction to quantum graphs*, Number 186, American Mathematical Soc., 2013

Biamonte, J. D., Clark, S. R., and Jaksch, D., (2011), "Categorical tensor network states", *AIP Advances,* Vol.1, No.4, pp.042172, 2011

Braunstein, S. L., Ghosh, S., Mansour, T., Severini, S., and Wilson, R. C., (2006a), "Some families of density matrices for which separability is easily tested", *Physical Review A,* Vol.73, No.1, pp.012320, 2006

Braunstein, S. L., Ghosh, S., and Severini, S., (2006b), "The Laplacian of a graph as a density matrix: a basic combinatorial approach to separability of mixed states", *Annals of Combinatorics,* Vol.10, No.3, pp.291–317, 2006

Briegel, H. J. and Raussendorf, R., (2001), "Persistent entanglement in arrays of interacting particles", *Physical Review Letters,* Vol.86, No.5, pp.910, 2001

Brodutch, A. and Terno, D. R., (2016), "Why should we care about quantum discord?", *arXiv preprint arXiv:1608.01920,*, 2016

Brouwer, A. E. and Spence, E., (2009), "Cospectral graphs on 12 vertices", *Electronic Journal of Combinatorics,* Vol.16, No.1, pp.N20, 2009

Butler, S., (2010), "A note about cospectral graphs for the adjacency and normalized Laplacian matrices", *Linear and Multilinear Algebra,* Vol.58, No.3, pp.387–390, 2010

Cerf, N., Adami, C., and Gingrich, R., (1997), "Quantum conditional operator and a criterion for separability", *arXiv preprint quant-ph/9710001,*, 1997

Chen, K. and Wu, L.-A., (2002), "A matrix realignment method for recognizing entanglement", *arXiv preprint quant-ph/0205017,*, 2002

Cordella, L. P., Foggia, P., Sansone, C., and Vento, M., (2001), "An improved algorithm for matching large graphs", In *3rd IAPR-TC15 workshop on graph-based representations in pattern recognition*, pp. 149–159

Coutinho, G., (2014), "Quantum state transfer in graphs", 2014

Cover, T. M. and Thomas, J. A., (2012), *Elements of information theory*, John Wiley & Sons, 2012

Cuntz, J. and Krieger, W., (1980), "A class ofC*-algebras and topological Markov chains", *Inventiones mathematicae,* Vol.56, No.3, pp.251–268, 1980

Cvetković, D. and Simić, S. K., (2009), "Towards a spectral theory of graphs based on the signless Laplacian, I", *Publ. Inst. Math.(Beograd),* Vol.85, No.99, pp.19–33, 2009

Cvetković, D. and Simić, S. K., (2010a), "Towards a spectral theory of graphs based on the signless Laplacian, II", *Linear Algebra and its Applications,* Vol.432, No.9, pp.2257–2272, 2010

Cvetković, D. and Simić, S. K., (2010b), "Towards a spectral theory of graphs based on the signless Laplacian, III", *Applicable Analysis and Discrete Mathematics,*, pp.156–166, 2010

Cvetkovic, D. M., Doob, M., and Sachs, H., (1980), "Spectra of graphs. Theory and application", 1980

Dakić, B., Vedral, V., and Brukner, Č., (2010), "Necessary and sufficient condition for nonzero quantum discord", *Physical review letters,* Vol.105, No.19, pp.190502, 2010

Dalfó, C. and Fiol, M., (2016), "Cospectral digraphs from locally line digraphs", *Linear Algebra and its Applications,* Vol.500,, pp.52–62, 2016

Dür, W., Vidal, G., and Cirac, J. I., (2000), "Three qubits can be entangled in two inequivalent ways", *Physical Review A,* Vol.62, No.6, pp.062314, 2000

Dutta, S., Adhikari, B., and Banerjee, S., (2016a), "A graph theoretical approach to states and unitary operations", *Quantum Information Processing,* Vol.15, No.5, pp.2193–2212, 2016

Dutta, S., Adhikari, B., and Banerjee, S., (2017a), "Quantum discord of states arising from graphs", *Quantum Information Processing,* Vol.16, No.8, pp.183, 2017

Dutta, S., Adhikari, B., and Banerjee, S., (2017b), "Zero discord quantum states arising from weighted digraphs", *arXiv preprint arXiv:1705.00808,*, 2017

Dutta, S., Adhikari, B., Banerjee, S., and Srikanth, R., (2016b), "Bipartite separability and nonlocal quantum operations on graphs", *Physical Review A,* Vol.94, No.1, pp.012306, 2016

Einstein, A., Podolsky, B., and Rosen, N., (1935), "Can quantum-mechanical description of physical reality be considered complete?", *Physical review,* Vol.47, No.10, pp.777, 1935

Garcia, S. R. and Tener, J. E., (2009), "Unitary equivalence of a matrix to its transpose", *arXiv preprint arXiv:0908.2107,*, 2009

Godsil, C. D. and McKay, B., (1982), "Constructing cospectral graphs", *Aequationes Mathematicae,* Vol.25, No.1, pp.257–268, 1982

Greenberger, D. M., Horne, M. A., Shimony, A., and Zeilinger, A., (1990), "Bell's theorem without inequalities", *American Journal of Physics,* Vol.58, No.12, pp.1131–1143, 1990

Guo, Y., (2016), "Non-commutativity measure of quantum discord", *Scientific reports,* Vol.6,, 2016

Hassan, A. S. M. and Joag, P. S., (2007), "A combinatorial approach to multipartite quantum systems: basic formulation", *Journal of Physics A: Mathematical and Theoretical,* Vol.40, No.33, pp.10251, 2007

Hassan, A. S. M. and Joag, P. S., (2008), "On the degree conjecture for separability of multipartite quantum states", *Journal of Mathematical Physics,* Vol.49, No.1, pp.012105, 2008

Hein, M., Eisert, J., and Briegel, H. J., (2004), "Multiparty entanglement in graph states", *Physical Review A,* Vol.69, No.6, pp.062311, 2004

Henderson, L. and Vedral, V., (2001), "Classical, quantum and total correlations", *Journal of physics A: mathematical and general,* Vol.34, No.35, pp.6899, 2001

Hildebrand, R., Mancini, S., and Severini, S., (2008), "Combinatorial laplacians and positivity under partial transpose", *Mathematical Structures in Computer Science,* Vol.18, No.1, pp.205–219, 2008

Hora, A. and Obata, N., (2007), *Quantum probability and spectral analysis of graphs*, Springer Science & Business Media, 2007

Horn, R. A. and Johnson, C. R., (1991), *Topics in matrix analysis*, Cambridge Univ. Press Cambridge etc, 1991

Horn, R. A. and Johnson, C. R., (2012), *Matrix analysis*, Cambridge university press, 2012

Horodecki, M. and Horodecki, P., (1999), "Reduction criterion of separability and limits for a class of distillation protocols", *Physical Review A,* Vol.59, No.6, pp.4206, 1999

Horodecki, M., Horodecki, P., and Horodecki, R., (2001), "Separability of n-particle mixed states: necessary and sufficient conditions in terms of linear maps", *Physics Letters A,* Vol.283, No.1, pp.1–7, 2001

Horodecki, P., (1997), "Separability criterion and inseparable mixed states with positive partial transposition", *arXiv preprint quant-ph/9703004,*, 1997

Horodecki, P., Lewenstein, M., Vidal, G., and Cirac, I., (2000), "Operational criterion and constructive checks for the separability of low-rank density matrices", *Physical Review A,* Vol.62, No.3, pp.032310, 2000

Horodecki, R., Horodecki, P., Horodecki, M., and Horodecki, K., (2009), "Quantum entanglement", *Reviews of modern physics,* Vol.81, No.2, pp.865, 2009

Huang, J.-H., Wang, L., and Zhu, S.-Y., (2011), "A new criterion for zero quantum discord", *New Journal of Physics,* Vol.13, No.6, pp.063045, 2011

Huang, Y., (2014), "Computing quantum discord is NP-complete", *New journal of physics,* Vol.16, No.3, pp.033027, 2014

Huffman, W. C. and Pless, V., (2010), *Fundamentals of error-correcting codes*, Cambridge university press, 2010

Hui, Z. and Jiao, F., (2013), "Separability of Generalized Graph Product States", *Chinese Physics Letters,* Vol.30, No.9, pp.090303, 2013

Kaplansky, I., (1974), *Linear algebra and geometry: a second course*, Courier Corporation, 1974

Konno, N., (2008), "Quantum walks", In *Quantum Potential Theory*, pp. 309–452, Springer

Konno, N. and Sato, I., (2012), "On the relation between quantum walks and zeta functions", *Quantum Information Processing,* Vol.11, No.2, pp.341–349, 2012

Krammer, P., (2005), *Quantum entanglement: Detection, classification, and quantification*, na, 2005

Kuś, M. and Bengtsson, I., (2009), ""Classical" quantum states", *Physical Review A,* Vol.80, No.2, pp.022319, 2009

Li, J.-Q., Chen, X.-B., and Yang, Y.-X., (2015), "Quantum state representation based on combinatorial Laplacian matrix of star-relevant graph", *Quantum Information Processing,* Vol.14, No.12, pp.4691–4713, 2015

Lim, H. and Joynt, R., (2014), "Sudden decoherence transitions for quantum discord", *Journal of Physics A: Mathematical and Theoretical,* Vol.47, No.13, pp.135305, 2014

Lockhart, J. and Severini, S., (2016), "Combinatorial Entanglement", *arXiv preprint arXiv:1605.03564,*, 2016

Louck, J. D., (2008), *Unitary symmetry and combinatorics*, World Scientific, 2008

Luo, S., (2008), "Using measurement-induced disturbance to characterize correlations as classical or quantum", *Physical Review A,* Vol.77, No.2, pp.022301, 2008

Luo, S. and Fu, S., (2010), "Geometric measure of quantum discord", *Physical Review A,* Vol.82, No.3, pp.034302, 2010

Lusztig, G., (2010), *Introduction to quantum groups*, Springer Science & Business Media, 2010

MacKay, D. J., Mitchison, G., and McFadden, P. L., (2004), "Sparse-graph codes for quantum error

correction", *IEEE Transactions on Information Theory,* Vol.50, No.10, pp.2315–2330, 2004
Merris, R., (1998), "Laplacian graph eigenvectors", *Linear algebra and its applications,* Vol.278, No.1-3, pp.221–236, 1998
Neumann, J., (1932), *Mathematische Grundlagen der Quantenmechanik*, Grundlehren der mathematischen Wissenschaften, Springer Berlin Heidelberg, 1932
Nielsen, Michael A and Chuang, Isaac,*Quantum computation and quantum information,*
Ollivier, H. and Zurek, W. H., (2001), "Quantum discord: a measure of the quantumness of correlations", *Physical review letters,* Vol.88, No.1, pp.017901, 2001
Orús, R., (2014), "A practical introduction to tensor networks: Matrix product states and projected entangled pair states", *Annals of Physics,* Vol.349,, pp.117–158, 2014
Parthasarathy, K. R., (2013), *Coding theorems of classical and quantum Information theory*, Hindustan Book Agency, 2013
Peres, A., (1996), "Separability criterion for density matrices", *Physical Review Letters,* Vol.77, No.8, pp.1413, 1996
Pirandola, S., (2013), "Quantum discord as a resource for quantum cryptography", *arXiv preprint arXiv:1309.2446,*, 2013
Rahiminia, H. and Amini, M., (2008), "On separability of graphs with some entangled edges.", *Quantum Information & Computation,* Vol.8, No.6, pp.664–670, 2008
Roth, J.-P., (1984), "Le spectre du laplacien sur un graphe", *Théorie du potentiel,*, pp.521–539, 1984
Rudolph, O., (2003), "On the cross norm criterion for separability", *Journal of Physics A: Mathematical and General,* Vol.36, No.21, pp.5825, 2003
Ruedenberg, K. and Scherr, C. W., (1953), "Free-Electron Network Model for Conjugated Systems. I. Theory", *The Journal of Chemical Physics,* Vol.21, No.9, pp.1565–1581, 1953
Sabapathy, K. K. and Simon, R., (2013), "Quantum discord for two-qubit $X$-states: A comprehensive approach inspired by classical polarization optics", *arXiv preprint arXiv:1311.0210,*, 2013
Schlingemann, D. and Werner, R. F., (2001), "Quantum error-correcting codes associated with graphs", *Physical Review A,* Vol.65, No.1, pp.012308, 2001
Schult, D. A. and Swart, P., (2008), "Exploring network structure, dynamics, and function using NetworkX", In *Proceedings of the 7th Python in Science Conferences (SciPy 2008)*, volume 2008, pp. 11–16
Seidel, J. J., (1974), "Graphs and two-graphs", In *Proceedings of the Fifth Southeastern Conference on Combinatorics, Graph Theory and Computing (Florida Atlantic Univ., Boca Raton, Fla., 1974), Congressus Numerantium, No. X, Utilitas Math., Winnipeg, Man*, pp. 125–143
Shannon, C. E. and Weaver, W., (1998), *The mathematical theory of communication*, University of Illinois press, 1998
Shor, P. W., (1995), "Scheme for reducing decoherence in quantum computer memory", *Physical review A,* Vol.52, No.4, pp.R2493, 1995
Simmons, D., Coon, J., and Datta, A., (2017), "The Quantum Theil Index: Characterizing Graph Centralization using von Neumann Entropy", *arXiv preprint arXiv:1707.07906,*, 2017
Streltsov, A., (2014), "Quantum Discord and its Role in Quantum Information Theory", *ArXiv e-prints,*, November 2014
Terhal, B. M., (2000), "Bell inequalities and the separability criterion", *Physics Letters A,* Vol.271, No.5, pp.319–326, 2000
Terhal, B. M., (2002), "Detecting quantum entanglement", *Theoretical Computer Science,* Vol.287, No.1, pp.313–335, 2002
Terras, A., (2010), *Zeta functions of graphs: a stroll through the garden*, volume 128, Cambridge University Press, 2010
Tonchev, V. D., (2002), "Error-correcting codes from graphs", *Discrete mathematics,* Vol.257, No.2-3, pp.549–557, 2002
van Dam, E. R. and Haemers, W. H., (2003), "Which graphs are determined by their spectrum?", *Linear Algebra and its Applications,* Vol.373,, pp.241 – 272, 2003

Van Loan, C. F., (2000), "The ubiquitous Kronecker product", *Journal of computational and applied mathematics,* Vol.123, No.1, pp.85–100, 2000

Wang, Z. and Wang, Z., (2007), "The tripartite separability of density matrices of graphs", *the electronic journal of combinatorics,* Vol.14, No.1, pp.R40, 2007

Werner, R. F., (1989), "Quantum states with Einstein-Podolsky-Rosen correlations admitting a hidden-variable model", *Physical Review A,* Vol.40, No.8, pp.4277, 1989

West, D. B., (2001), *Introduction to graph theory*, Prentice hall Upper Saddle River, 2001

White, S. R., (1992), "Density matrix formulation for quantum renormalization groups", *Physical review letters,* Vol.69, No.19, pp.2863, 1992

Wu, C. W., (2006a), "Conditions for separability in generalized Laplacian matrices and diagonally dominant matrices as density matrices", *Physics Letters A,* Vol.351, No.1, pp.18–22, 2006

Wu, C. W., (2006b), "Conditions for separability in generalized Laplacian matrices and diagonally dominant matrices as density matrices", *Physics Letters A,* Vol.351, No.1, pp.18–22, 2006

Wu, C. W., (2009), "Multipartite separability of Laplacian matrices of graphs", *the electronic journal of combinatorics,* Vol.16, No.1, pp.R61, 2009

Wu, C. W., (2010), "On graphs whose Laplacian matrix's multipartite separability is invariant under graph isomorphism", *Discrete Mathematics,* Vol.310, No.21, pp.2811–2814, 2010

Xie, C., Zhao, H., and Wang, Z., (2013), "Separability of density matrices of graphs for multipartite systems", *the electronic journal of combinatorics,* Vol.20, No.4, pp.P21, 2013

Yeo, Y. and Chua, W. K., (2006), "Teleportation and dense coding with genuine multipartite entanglement", *Physical review letters,* Vol.96, No.6, pp.060502, 2006

Zhao, H., Zhao, J. Y., and Jing, N., (2017), "Multipartite separability of density matrices of graphs", *arXiv preprint arXiv:1708.00883,*, 2017