References

[1]P. Franken A. Brandt and B. Lisek. *Stationary Stochastic Models.* Akademie-Verlag, Berlin, 1990.

[2]D. Aldous and P. Diaconis. Strong uniform times and finite random walks. *Adv. Applied Maths.*, 8:69–97, 1987.

[3]E. Altman, P. Konstantopoulos, and Z. Liu. Stability, monotonicity and invariant quantities in general polling systems. *Queueing Systems*, 11:35–57, 1992.

[4]B. D. O. Anderson and J. B. Moore. *Optimal Control: Linear Quadratic Methods.* Prentice-Hall, Englewood Cliffs, NJ, 1990.

[5]W.J. Anderson. *Continuous-time Markov Chains: An Applications-Oriented Approach.* Springer-Verlag, New York, 1991.

[6]M. Aoki. *State Space Modeling of Time Series.* Springer-Verlag, Berlin, 1990.

[7]A. Arapostathis, V. S. Borkar, E. Fernandez-Gaucherand, M. K. Ghosh, and S. I. Marcus. Discrete-time controlled Markov processes with average cost criterion: a survey. *SIAM J. Control Optim.*, 31:282–344, 1993.

[8]E. Arjas and E. Nummelin. A direct construction of the R-invariant measure for a Markov chain on a general state space. *Ann. Probab.*, 4:674–679, 1976.

[9]E. Arjas, E. Nummelin, and R. L. Tweedie. Uniform limit theorems for non-singular renewal and Markov renewal processes. *J. Appl. Probab.*, 15:112–125, 1978.

[10]S. Asmussen. *Applied Probability and Queues.* John Wiley & Sons, New York, 1987.

[11]K. B. Athreya and P. Ney. *Branching processes.* Springer-Verlag, New York, 1972.

[12]K. B. Athreya and P. Ney. A new approach to the limit theory of recurrent Markov chains. *Trans. Amer. Math. Soc.*, 245:493–501, 1978.

[13]K. B. Athreya and P. Ney. Some aspects of ergodic theory and laws of large numbers for Harris recurrent Markov chains. *Colloquia Mathematica Societatis János Bolyai. Nonparametric Statistical Inference*, 32:41–56, 1980. Budapest, Hungary.

[14]K. B. Athreya and S. G. Pantula. Mixing properties of Harris chains and autoregressive processes. *J. Appl. Probab.*, 23:880–892, 1986.

[15]D. J. Bartholomew and D. J. Forbes. *Statistical Techniques for Manpower Planning.* John Wiley & Sons, New York, 1979.

[16]R. Bartoszyński. On the risk of rabies. *Math. Biosci.*, 24:355–377, 1975.

[17]Peter H. Baxendale. Uniform estimates for geometric ergodicity of recurrent Markov processes. Unpublished report, University of Southern California, 1993.

[18]V. E. Beneš. Existence of finite invariant measures for Markov processes. *Proc. Amer. Math. Soc.*, 18:1058–1061, 1967.

[19]V. E. Beneš. Finite regular invariant measures for Feller processes. *J. Appl. Probab.*, 5:203–209, 1968.

[20]H. C. P. Berbee. *Random walks with stationary increments and renewal theory.* PhD thesis, De Vrije University, Amsterdam, 1979.

[21]J. R. L. Bernard, editor. *Macquarie English Thesaurus.* Macquarie Library, 1984.

[22]N. P. Bhatia and G. P. Szegö. *Stability Theory of Dynamical Systems.* Springer-Verlag, New York, 1970.

[23]R. N. Bhattacharaya. On the functional central limit theorem and the law of the iterated logarithm for Markov processes. *Z. Wahrscheinlichkeitstheorie und Verw. Geb.*, 60:185–201, 1982.

[24]P. Billingsley. *Convergence of Probability Measures.* John Wiley & Sons, New York, 1968.

[25]P. Billingsley. *Probability and Measure.* John Wiley & Sons, New York, 1986.

[26]H. Bonsdorff. Characterisation of uniform recurrence for general Markov chains. *Ann. Acad. Scientarum Fennicae Ser. A, I. Mathematica, Dissertationes*, 32, 1980.

[27]A. A. Borovkov. Limit theorems for queueing networks. *Theory Probab. Appl.*, 31:413–427, 1986.

[28]A. Brandt. The stochastic equation $y_{n+1} = a_n y_n + b_n$ with stationary coefficients. *Adv. Appl. Probab.*, 18:211–220, 1986.

[29]L. Breiman. The strong law of large numbers for a class of Markov chains. *Ann. Math. Statist.*, 31:801–803, 1960.

[30]L. Breiman. Some probabilistic aspects of the renewal theorem. In *Trans. 4th Prague Conf. on Inf. Theory, Statist. Dec. Functions and Random Procs.*, pages 255–261, Prague, 1967. Academia.

[31]L. Breiman. *Probability.* Addison-Wesley, Reading, MA, 1968.

[32]P. J. Brockwell and R. A. Davis. *Time Series: Theory and Methods.* Springer-Verlag, New York, 2nd edition, 1991.

[33]P. J. Brockwell, J. Liu, and R. L. Tweedie. On the existence of stationary threshold autoregressive moving-average processes. *J. Time Ser. Anal.*, 13:95–107, 1992.

[34]P. J. Brockwell, S. J. Resnick, and R. L. Tweedie. Storage processes with general release rule and additive inputs. *Adv. Appl. Probab.*, 14:392–433, 1982.

[35]P.J. Brockwell. Personal communication. 1992.

[36]G. A. Brosamler. An almost everywhere central limit theorem. *Math. Proc. Cambridge Philos. Soc.*, 104:561–574, 1988.

[37]J. B. Brown. *Ergodic Theory and Topological Dynamics.* Academic Press, New York, 1976.

[38]S. Browne and K. Sigman. Work-modulated queues with applications to storage processes. *J. Appl. Probab.*, 29:699–712, 1992.

[39]P. E. Caines. *Linear Stochastic Systems.* John Wiley & Sons, New York, 1988.

[40]E. Çinlar. *Introduction to Stochastic Processes.* Prentice-Hall, Englewood Cliffs, NJ, 1975.

[41]K. S. Chan. *Topics in Nonlinear Time Series Analysis.* PhD thesis, Princeton University, 1986.

[42]K. S. Chan. A note on the geometric ergodicity of a Markov chain. *Adv. Appl. Probab.*, 21:702–704, 1989.

[43]K. S. Chan, J. Petruccelli, H. Tong, and S. W. Woolford. A multiple threshold AR(1) model. *J. Appl. Probab.*, 22:267–279, 1985.

[44]K.S. Chan. Asymptotic behaviour of the Gibbs sampler. *J. Amer. Statist. Assoc.*, 88:320–326, 1993.

[45]H. Chen. Fluid approximations and stability of multiclass queueing networks I: Work conserving disciplines. Technical Report, 1994.

[46]R. Chen and R. S. Tsay. On the ergodicity of TAR(1) processes. *Ann. Appl. Probab.*, 1:613–634, 1991.

[47]Y. S. Chow and H. Robbins. A renewal theorem for random variables which are dependent or non-identically distributed. *Ann. Math. Statist.*, 34:390–395, 1963.

[48]K. L. Chung. The general theory of Markov processes according to Doeblin. *Z. Wahrscheinlichkeitstheorie und Verw. Geb.*, 2:230–254, 1964.

[49]K. L. Chung. *Markov Chains with Stationary Transition Probabilities.* Springer-Verlag, Berlin, 2nd edition, 1967.

[50]K. L. Chung. *A Course in Probability Theory.* Academic Press, New York, 2nd edition, 1974.

[51]K. L. Chung and D. Ornstein. On the recurrence of sums of random variables. *Bull. Amer. Math. Soc.*, 68:30–32, 1962.

[52]R. Cogburn. The central limit theorem for Markov processes. In *Proceedings of the 6th Berkeley Symposium on Mathematical Statistics and Probability*, pages 485–512. University of California Press, 1972.

[53]R. Cogburn. A uniform theory for sums of Markov chain transition probabilities. *Ann. Probab.*, 3:191–214, 1975.

[54]J. W. Cohen. *The Single Server Queue.* North-Holland, Amsterdam, 2nd edition, 1982.

[55]C. Constantinescu and A. Cornea. *Potential Theory on Harmonic Spaces.* Springer-Verlag, Berlin, 1972.

[56]P. C. Consul. Evolution of surnames. *Int. Statist. Rev.*, 59:271–278, 1991.

[57]J. G. Dai. On positive Harris recurrence of multiclass queueing networks: a unified approach via fluid limit models. *Ann. Appl. Probab.*, 5(1):49–77, 1995.

[58]J. G. Dai and S. P. Meyn. Stability and convergence of moments for multiclass queueing networks via fluid limit models. *IEEE Trans. Automat. Control*, 40:1889–1904, November 1995.

[59]J. G. Dai and G. Weiss. Stability and instability of fluid models for reentrant lines. *Math. Operations Res.*, 21(1):115–134, 1996.

[60]D. Daley. The serial correlation coefficients of waiting times in a stationary single server queue. *J. Aust. Math. Soc.*, 8:683–699, 1968.

[61]C. Derman. A solution to a set of fundamental equations in Markov chains. *Proc. Amer. Math. Soc.*, 5:332–334, 1954.

[62]P. Diaconis. *Group Representations in Probability and Statistics.* Institute of Mathematical Statistics, Hayward, 1988.

[63]J. Diebolt. Loi stationnaire et loi des fluctuations pour le processus autorégressif général d'ordre un. *C. R. Acad. Sci.*, 310:449–453, 1990.

[64]J. Diebolt and D. Guégan. Probabilistic properties of the general nonlinear Markovian process of order one and applications to time series modeling. Technical report 125, Laboratoire de Statistique Théorique et Appliquée, Université Paris, 1990.

[65]W. Doeblin. Sur les propriétés asymptotiques de mouvement régis par certain types de chaînes simples. *Bull. Math. Soc. Roum. Sci.*, 39(1):57–115; (2), 3–61, 1937.

[66]W. Doeblin. Exposé de la théorie des chaînes simples constantes de Markov à un nombre fini d'états. *Revue Mathematique de l'Union Interbalkanique*, 2:77–105, 1938.

[67]W. Doeblin. Eléments d'une théorie générale des chaînes simples constantes de Markov. *Annales Scientifiques de l'Ecole Normale Supérieure*, 57(III):61–111, 1940.

[68]J. L. Doob. *Stochastic Processes.* John Wiley & Sons, New York, 1953.

[69]M. Duflo. *Méthodes Récursives Aléatoires.* Masson, 1990.

[70]E. B. Dynkin. *Markov Processes I, II.* Academic Press, New York, 1965.

[71]S. N. Ethier and T. G. Kurtz. *Markov Processes : Characterization and Convergence.* John Wiley & Sons, New York, 1986.

[72]G. Fayolle. On random walks arising in queueing systems: ergodicity and transience via quadratic forms as Lyapounov functions - part I. *Queueing Systems*, 5:167–183, 1989.

[73]G. Fayolle, V. A. Malyšhev, M.V. Men'šikov, and A. F. Sidorenko. Lyapunov functions for Jackson networks. Technical Report, INRIA Rocquencourt, 1991.

[74]P. D. Feigin and R. L. Tweedie. Random coefficient autoregressive processes: a Markov chain analysis of stationarity and finiteness of moments. *J. Time Ser. Anal.*, 6:1–14, 1985.

[75]P. D. Feigin and R. L. Tweedie. Linear functionals and Markov chains associated with the Dirichlet process. *Math. Proc. Camb. Phil. Soc.*, 105:579–585, 1989.

[76]W. Feller. *An Introduction to Probability Theory and its Applications Vol I.* John Wiley & Sons, 3rd edition, 1968.

[77]W. Feller. *An Introduction to Probability Theory and its Applications Vol II.* John Wiley & Sons, New York, 2nd edition, 1971.

[78]S. R. Foguel. Positive operators on $C(X)$. *Proc. Amer. Math. Soc.*, 22:295–297, 1969.

[79]S. R. Foguel. *The Ergodic Theory of Markov Processes.* Van Nostrand Reinhold, New York, 1969.

[80]S. R. Foguel. The ergodic theory of positive operators on continuous functions. *Ann. Scuola Norm. Sup. Pisa*, 27:19–51, 1973.

[81]S. R. Foguel. *Selected Topics in the Study of Markov Operators.* Carolina Lecture Series. Dept. of Mathematics, University of North Carolina at Chapel Hill, 1980.

[82]F. G. Foster. On the stochastic matrices associated with certain queuing processes. *Ann. Math. Statist.*, 24:355–360, 1953.

[83]J. J. Fuchs and B. Delyon. Adaptive control of a simple time-varying system. *IEEE Trans. Automat. Control*, 37:1037–1040, 1992.

[84]H. Furstenberg and H. Kesten. Products of random matrices. *Ann. Math. Statist.*, 31:457–469, 1960.

[85]J. M. Gani and I. W. Saunders. Some vocabulary studies of literary texts. *Sankhyā Ser. B*, 38:101–111, 1976.

[86]P. W. Glynn and S. P. Meyn. A Liapounov bound for solutions of the Poisson equation. *Ann. Probab.*, 24(2):916–931, 1996.

[87]G. C. Goodwin, P. J. Ramadge, and P. E. Caines. Discrete time stochastic adaptive control. *SIAM J. Control Optim.*, 19:829–853, 1981.

[88]C. W. J. Granger and P. Andersen. *An Introduction to Bilinear Time Series Models.* Vandenhoeck and Ruprecht, Göttingen, 1978.

[89]R. M. Gray. *Entropy and Information Theory.* Springer-Verlag, New York, 1990.

[90]D. Guégan. Different representations for bilinear models. *J. Time Ser. Anal.*, 8:389–408, 1987.

[91]L. Guo and S. P. Meyn. Adaptive control for time-varying systems: A combination of martingale and Markov chain techniques. *Int. J. Adaptive Control and Signal Processing*, 3:1–14, 1989.

[92]M. Guo and J. Petruccelli. On the null recurrence and transience of a first-order SETAR model. *J. Appl. Probab.*, 28:584–592, 1991.

[93]P. Hall and C. C. Heyde. *Martingale limit theory and its application.* Academic Press Inc. [Harcourt Brace Jovanovich Publishers], New York, 1980. Probability and Mathematical Statistics.

[94]P. R. Halmos. *Measure Theory.* Van Nostrand, Princeton, 1950.

[95]T. E. Harris. The existence of stationary measures for certain Markov processes. In *Proceedings of the 3rd Berkeley Symposium on Mathematical Statistics and Probability*, volume 2, pages 113–124. University of California Press, 1956.

[96]J. M. Harrison and S. I. Resnick. The stationary distribution and first exit probabilities of a storage process with general release rule. *Math. Operations Res.*, 1:347–358, 1976.

[97]I. N. Herstein. *Topics in Algebra.* John Wiley & Sons, New York, 2nd edition, 1975.

[98]G. Högnas. On random walks with continuous components. Preprint no 26, Aarhus Universitet, 1977.

[99]A. Hordijk and F.M. Spieksma. On ergodicity and recurrence properties of a Markov chain with an application. *Adv. Appl. Probab.*, 24:343–376, 1992.

[100]C. Huang and D. Isaacson. Ergodicity using mean visit times. *J. Lond. Math. Soc.*, 14:570–576, 1976.

[101]K. Ichihara and H. Kunita. A classification of the second order degenerate elliptic operator and its probabilistic characterization. *Z. Wahrscheinlichkeitstheorie und Verw. Geb.*, 30:235–254, 1974.

[102]N. Ikeda and S. Watanabe. *Stochastic Differential Equations and Diffusion Processes.* North-Holland, Amsterdam, 1981.

[103]R. Isaac. Some topics in the theory of recurrent Markov processes. *Duke Math. J.*, 35:641–652, 1968.

[104]D. Isaacson and R. L. Tweedie. Criteria for strong ergodicity of Markov chains. *J. Appl. Probab.*, 15:87–95, 1978.

[105]N. Jain. Some limit theorem for a general Markov process. *Z. Wahrscheinlichkeitstheorie und Verw. Geb.*, 6:206–223, 1966.

[106]N. Jain and B. Jamison. Contributions to Doeblin's theory of Markov processes. *Z. Wahrscheinlichkeitstheorie und Verw. Geb.*, 8:19–40, 1967.

[107]B. Jakubczyk and E. D. Sontag. Controllability of nonlinear discrete-time systems: A lie-algebraic approach. *SIAM J. Control Optim.*, 28:1–33, 1990.

[108]B. Jamison. Asymptotic behavior of successive iterates of continuous functions under a Markov operator. *J. Math. Anal. Appl.*, 9:203–214, 1964.

[109]B. Jamison. Ergodic decomposition induced by certain Markov operators. *Trans. Amer. Math. Soc.*, 117:451–468, 1965.

[110]B. Jamison. Irreducible Markov operators on $C(S)$. *Proc. Amer. Math. Soc.*, 24:366–370, 1970.

[111]B. Jamison and S. Orey. Markov chains recurrent in the sense of Harris. *Z. Wahrscheinlichkeitstheorie und Verw. Geb.*, 8:41–48, 1967.

[112]B. Jamison and R. Sine. Sample path convergence of stable Markov processes. *Z. Wahrscheinlichkeitstheorie und Verw. Geb.*, 28:173–177, 1974.

[113]D.A. Jones. Non-linear autoregressive processes. *Proc. Roy. Soc. A*, 360:71–95, 1978.

[114]M. Kac. On the notion of recurrence in discrete stochastic processes. *Bull. Amer. Math. Soc.*, 53:1002–1010, 1947.

[115]V. V. Kalashnikov. Analysis of ergodicity of queueing systems by Lyapunov's direct method. *Avtomatica i Telemechanica*, 4:46–54, 1971. [in Russian].

[116]V. V. Kalashnikov. The property of gamma-reflexivity for Markov sequences. *Soviet Math. Dokl.*, 14:1869–1873, 1973.

[117]V. V. Kalashnikov. Stability analysis in queueing problems by the method of test functions. *Theory Probab. Appl.*, 22:86–103, 1977.

[118]V. V. Kalashnikov. *Qualitative Analysis of Complex Systems Behaviour by the Test Functions Method*. Nauka, Moscow, 1978. [in Russian].

[119]V. V. Kalashnikov and S. T. Rachev. *Mathematical Methods for Construction of Queueing Models*. Wadsworth and Brooks/Cole, New York, 1990.

[120]R. E. Kalman and J. E. Bertram. Control system analysis and design by the second method of Lyapunov. *Trans. ASME Ser. D: J. Basic Eng.*, 82:371–400, 1960.

[121]M. Kaplan. A sufficient condition for nonergodicity of a Markov chain. *IEEE Trans. Inform. Theory*, 25:470–471, 1979.

[122]S. Karlin and H. M. Taylor. *A First Course in Stochastic Processes*. Academic Press, New York, 2nd edition, 1975.

[123]H. A. Karlsen. Existence of moments in a stationary stochastic difference equation. *Adv. Appl. Probab.*, 22:129–146, 1990.

[124]N. V. Kartashov. Criteria for uniform ergodicity and strong stability of Markov chains with a common phase space. *Theory Probab. Appl.*, 30:71–89, 1985.

[125]N.V. Kartashov. Inequalities in theorems of ergodicity and stability for Markov chains with a common phase space. *Theory Probab. Appl.*, 30:247–259, 1985.

[126]J. L. Kelley. *General Topology*. Van Nostrand, Princeton, NJ, 1955.

[127]F. P. Kelly. *Reversibility and Stochastic Networks*. John Wiley & Sons, New York, 1979.

[128]D. G. Kendall. Some problems in the theory of queues. *J. Roy. Statist. Soc. Ser. B*, 13:151–185, 1951.

[129]D. G. Kendall. Stochastic processes occurring in the theory of queues and their analysis by means of the imbedded Markov chain. *Ann. Math. Statist.*, 24:338–354, 1953.

[130]D. G. Kendall. Unitary dilations of Markov transition operators and the corresponding integral representation for transition-probability matrices. In U. Grenander, editor, *Probability and Statistics*, pages 139–161. Almqvist and Wiksell, Stockholm, 1959.

[131]D. G. Kendall. Geometric ergodicity in the theory of queues. In K. J. Arrow, S. Karlin, and P. Suppes, editors, *Mathematical Methods in the Social Sciences*, pages 176–195. Stanford University Press, Stanford, 1960.

[132]D. G. Kendall. Kolmogorov as I remember him. *Stat. Science*, 6:303–312, 1991.

[133]G. Kersting. On recurrence and transience of growth models. *J. Appl. Probab.*, 23:614–625, 1986.

[134]R. Z. Khas'minskii. *Stochastic Stability of Differential Equations.* Sijthoff & Noordhoff, Netherlands, 1980.

[135]J. F. C. Kingman. The ergodic behaviour of random walks. *Biometrika*, 48:391–396, 1961.

[136]J. F. C. Kingman. *Regenerative Phenomena.* John Wiley & Sons, London, 1972.

[137]A. Klein, L. J. Landau, and D. S. Shucker. Decoupling inequalities for stationary Gaussian processes. *Ann. Probab.*, 10:702–708, 1981.

[138]W. Kliemann. Recurrence and invariant measures for degenerate diffusions. *Ann. Probab.*, 15:690–707, 1987.

[139]A. N. Kolmogorov. Über die analytischen methoden in der wahrscheinlichkeitsrechnung. *Math. Ann.*, 104:415–458, 1931.

[140]A. N. Kolmogorov. Anfangsgründe der theorie der Markoffschen ketten mit unendlichen vielen möglichen zuständen. *Mat. Sbornik N.S. Ser*, pages 607–610, 1936.

[141]U. Krengel. *Ergodic Theorems.* Walter de Gruyter, Berlin, New York, 1985.

[142]P. Krugman and M. Miller, editors. *Exchange Rate Targets and Currency Bands.* Cambridge University Press, Cambridge, 1992.

[143]P. R. Kumar and P. P. Varaiya. *Stochastic Systems: Estimation, Identification and Adaptive Control.* Prentice-Hall, Englewood Cliffs, NJ, 1986.

[144]H. Kunita. Diffusion processes and control systems. Course at the University of Paris, VI, 1974.

[145]H. Kunita. Supports of diffusion processes and controllability problems. In K. Itô, editor, *Proceedings of the International Symposium on Stochastic Differential Equations*, pages 163–185, New York, 1978. John Wiley & Sons.

[146]H. Kunita. *Stochastic Flows and Stochastic Differential Equations.* Cambridge University Press, Cambridge, 1990.

[147]B. C. Kuo. *Automatic Control Systems.* Prentice Hall, Englewood Cliffs, NJ, 6th edition, 1990.

[148]T. G. Kurtz. The central limit theorem for Markov chains. *Ann. Probab.*, 9:557–560, 1981.

[149]H. J. Kushner. *Stochastic Stability and Control.* Academic Press, New York, 1967.

[150]M. T. Lacey and W. Philipp. A note on the almost sure central limit theorem. *Statistics and Prob. Letters*, 9:201–205, 1990.

[151]J. Lamperti. Criteria for the recurrence or transience of stochastic processes I. *J. Math. Anal. Appl.*, 1:314–330, 1960.

[152]J. Lamperti. Criteria for stochastic processes II: passage time moments. *J. Math. Anal. Appl.*, 7:127–145, 1963.

[153]G. M. Laslett, D. B. Pollard, and R. L. Tweedie. Techniques for establishing ergodic and recurrence properties of continuous-valued Markov chains. *Nav. Res. Log. Quart.*, 25:455–472, 1978.

[154]M. Lin. Conservative Markov processes on a topological space. *Israel J. Math.*, 8:165–186, 1970.

[155]T. Lindvall. *Lectures on the Coupling Method.* John Wiley & Sons, New York, 1992.

[156]R. S. Liptster and A. N. Shiryayev. *Statistics of Random Processes, II Applications.* Springer-Verlag, New York, 1978.

[157]R. Lund and R. L. Tweedie. Rates of convergence for pathwise ordered Markov chains. Technical report, Colorado State University, 1993. accepted for publication.

[158]N. Maigret. Théorème de limite centrale pour une chaine de Markov récurrente Harris positive. *Ann. Inst. Henri Poincaré Ser B*, 14:425–440, 1978.

[159]V. A. Malyšev and M. V. Men′šikov. Ergodicity, continuity and analyticity of countable Markov chains. *Trudy Moskov. Mat. Obshch.*, 39:3–48, 235, 1979. *Trans. Moscow Math. Soc.*, pp. 1-48, 1981.

[160]V. A. Malyšhev. Classification of two-dimensional positive random walks and almost linear semi-martingales. *Soviet Math. Dokl.*, 13:136–139, 1972.

[161]I. M. Y. Mareels and R. R. Bitmead. Bifurcation effects in robust adaptive control. *IEEE Trans. Circuits and Systems*, 35:835–841, 1988.

[162]A. A. Markov. Extension of the law of large numbers to dependent quantities [in Russian]. *Izv. Fiz.-Matem. Obsch. Kazan Univ. (2nd Ser)*, 15:135–156, 1906.

[163]P. G. Marlin. On the ergodic theory of Markov chains. *Operations Res.*, 21:617–622, 1973.

[164]J. G. Mauldon. On non-dissipative Markov chains. *Proc. Cambridge Phil. Soc.*, 53:825–835, 1958.

[165]D. Q. Mayne. Optimal nonstationary estimation of the parameters of a linear system with Gaussian inputs. *J. Electron. Contr.*, 14:101, 1963.

[166]K.L. Mengersen and R.L. Tweedie. Rates of convergence of the Hastings and Metropolis algorithms. 1993. Submitted for publication.

[167]M. V. Men'šikov. Ergodicity and transience conditions for random walks in the positive octant of space. *Soviet Math. Dokl.*, 15:1118–1121, 1974.

[168]J.-F. Mertens, E. Samuel-Cahn, and S. Zamir. Necessary and sufficient conditions for recurrence and transience of Markov chains, in terms of inequalities. *J. Appl. Probab.*, 15:848–851, 1978.

[169]S. P. Meyn. Ergodic theorems for discrete time stochastic systems using a stochastic Lyapunov function. *SIAM J. Control Optim.*, 27:1409–1439, 1989.

[170]S. P. Meyn. A stability theory for Feller Markov chains with applications to adaptive control and time series analysis. Technical report, University of Illinois, 1991.

[171]S. P. Meyn and L. J. Brown. Model reference adaptive control of time varying and stochastic systems. *IEEE Trans. Automat. Control*, 38:1738–1753, 1993.

[172]S. P. Meyn and P. E. Caines. A new approach to stochastic adaptive control. *IEEE Trans. Automat. Control*, AC-32:220–226, 1987.

[173]S. P. Meyn and P. E. Caines. Stochastic controllability and stochastic Lyapunov functions with applications to adaptive and nonlinear systems. In *Stochastic Differential Systems. Proceedings of the 4th Bad Honnef Conference*, pages 235–257, Berlin, 1989. Springer-Verlag.

[174]S. P. Meyn and P. E. Caines. Asymptotic behavior of stochastic systems processing Markovian realizations. *SIAM J. Control Optim.*, 29:535–561, 1991.

[175]S. P. Meyn and D. G. Down. Stability of generalized Jackson networks. *Ann. Appl. Probab.*, 4:124–148, 1994.

[176]S. P. Meyn and L. Guo. Stability, convergence, and performance of an adaptive control algorithm applied to a randomly varying system. *IEEE Trans. Automat. Control*, AC-37:535–540, 1992.

[177]S. P. Meyn and L. Guo. Geometric ergodicity of a bilinear time series model. *Journal of Time Series Analysis*, 14(1):93–108, 1993.

[178]S. P. Meyn and R. L. Tweedie. Stability of Markovian processes I: Discrete time chains. *Adv. Appl. Probab.*, 24:542–574, 1992.

[179]S. P. Meyn and R. L. Tweedie. Generalized resolvents and Harris recurrence of Markov processes. *Contemporary Mathematics*, 149:227–250, 1993.

[180]S. P. Meyn and R. L. Tweedie. Stability of Markovian processes II: Continuous time processes and sampled chains. *Adv. Appl. Probab.*, 25:487–517, 1993.

[181]S. P. Meyn and R. L. Tweedie. Stability of Markovian processes III: Foster-Lyapunov criteria for continuous time processes. *Adv. Appl. Probab.*, 25:518–548, 1993.

[182]S. P. Meyn and R. L. Tweedie. The Doeblin decomposition. *Contemporary Mathematics*, 149:211–225, 1993.

[183]S. P. Meyn and R. L. Tweedie. Computable bounds for convergence rates of Markov chains. *Ann. Appl. Probab.*, 4:981–1011, 1994.

[184]S. P. Meyn and R. L. Tweedie. State-dependent criteria for convergence of Markov chains. *Ann. Appl. Probab.*, 4:149–168, 1994.

[185]H. D. Miller. Geometric ergodicity in a class of denumerable Markov chains. *Z. Wahrscheinlichkeitstheorie und Verw. Geb.*, 4:354–373, 1966.

[186]S. Mittnik. Nonlinear time series analysis with generalized autoregressions: A state space approach. Working Paper WP-91-06, State University of New York at Stony Brook, Stony Brook, NY, 1991.

[187]A. Mokkadem. PhD thesis, Université Paris Sud, Centre d'Orsay, 1987.
[188]P. A. P. Moran. The statistical analysis of the Canadian lynx cycle I: structure and prediction. *Aust. J. Zool.*, 1:163–173, 1953.
[189]P. A. P. Moran. *The Theory of Storage.* Methuen, London, 1959.
[190]M. D. Moustafa. Input-output Markov processes. *Proc. Koninkl. Ned. Akad. Wetensch.*, A60:112–118, 1957.
[191]P. Mykland, L. Tierney, and Bin Yu. Regeneration in Markov chain samplers. Technical Report 585, University of Minnesota, 1992.
[192]E. Nelson. The adjoint Markoff process. *Duke Math. J.*, 25:671–690, 1958.
[193]M. F. Neuts. Two Markov chains arising from examples of queues with state dependent service times. *Sankhyā Ser. A*, 297:259–264, 1967.
[194]M. F. Neuts. Markov chains with applications in queueing theory, which have a matrix-geometric invariant probability vector. *Adv. Appl. Probab.*, 10:185–212, 1978.
[195]M. F. Neuts. *Matrix-Geometric Solutions in Stochastic Models – An Algorithmic Approach.* Johns Hopkins University Press, Baltimore, MD, 1981.
[196]J. Neveu. Potentiel Markovien récurrent des chaînes de Harris. *Ann. Inst. Fourier, Grenoble*, 22:7–130, 1972.
[197]J. Neveu. *Discrete-Parameter Martingales.* North-Holland, Amsterdam, 1975.
[198]D. F. Nicholls and B. G. Quinn. *Random Coefficient Autoregressive Models: An Introduction.* Springer-Verlag, New York, 1982.
[199]S. Niemi and E. Nummelin. Central limit theorems for Markov random walks. *Commentationes Physico-Mathematicae*, 54, 1982.
[200]E. Nummelin. A splitting technique for Harris recurrent chains. *Z. Wahrscheinlichkeitstheorie und Verw. Geb.*, 43:309–318, 1978.
[201]E. Nummelin. Uniform and ratio limit theorems for Markov renewal and semi-regenerative processes on a general state space. *Ann. Inst. Henri Poincaré Ser B*, 14:119–143, 1978.
[202]E. Nummelin. *General Irreducible Markov Chains and Nonnegative Operators.* Cambridge University Press, Cambridge, 1984.
[203]E. Nummelin. On the Poisson equation in the potential theory of a single kernel. *Math. Scand.*, 68:59–82, 1991.
[204]E. Nummelin and P. Tuominen. Geometric ergodicity of Harris recurrent Markov chains with applications to renewal theory. *Stoch. Proc. Applns.*, 12:187–202, 1982.
[205]E. Nummelin and P. Tuominen. The rate of convergence in Orey's theorem for Harris recurrent Markov chains with applications to renewal theory. *Stoch. Proc. Applns.*, 15:295–311, 1983.
[206]E. Nummelin and R. L. Tweedie. Geometric ergodicity and R-positivity for general Markov chains. *Ann. Probab.*, 6:404–420, 1978.
[207]S. Orey. Recurrent Markov chains. *Pacific J. Math.*, 9:805–827, 1959.
[208]S. Orey. *Limit Theorems for Markov Chain Transition Probabilities.* Van Nostrand Reinhold, London, 1971.
[209]D. Ornstein. Random walks I. *Trans. Amer. Math. Soc.*, 138:1–43, 1969.
[210]D. Ornstein. Random walks II. *Trans. Amer. Math. Soc.*, 138:45–60, 1969.
[211]A. Pakes and D. Pollard. Simulation and the asymptotics of optimization estimators. *Econometrica*, 57:1027–1057, 1989.
[212]A. G. Pakes. Some conditions for ergodicity and recurrence of Markov chains. *Operations Res.*, 17:1048–1061, 1969.
[213]K. R. Parthasarathy. *Probability Measures on Metric Spaces.* Academic Press, New York, 1967.
[214]J. Petruccelli and S. W. Woolford. A threshold AR(1) model. *J. Appl. Probab.*, 21:270–286, 1984.
[215]J. W. Pitman. Uniform rates of convergence for Markov chain transition probabilities. *Z. Wahrscheinlichkeitstheorie und Verw. Geb.*, 29:193–227, 1974.
[216]D. B. Pollard and R. L. Tweedie. R-theory for Markov chains on a topological state space I. *J. London Math. Society*, 10:389–400, 1975.

[217]D. B. Pollard and R. L. Tweedie. R-theory for Markov chains on a topological state space II. *Z. Wahrscheinlichkeitstheorie und Verw. Geb.*, 34:269–278, 1976.

[218]N. Popov. Conditions for geometric ergodicity of countable Markov chains. *Soviet Math. Dokl.*, 18:676–679, 1977.

[219]M. Pourahmadi. On stationarity of the solution of a doubly stochastic model. *J. Time Ser. Anal.*, 7:123–131, 1986.

[220]N. U. Prabhu. *Queues and Inventories.* John Wiley & Sons, New York, 1965.

[221]R. Rayadurgam, S. P. Meyn, and L. Brown. Bayesian adaptive control of time varying systems. In *Proceedings of the 31st Conference on Decision and Control*, Tucson, AZ, 1992.

[222]S. I. Resnick. *Extreme Values, Regular Variation and Point Processes.* Springer-Verlag, New York, 1987.

[223]D. Revuz. *Markov Chains.* North-Holland, Amsterdam, 2nd edition, 1984.

[224]G. O. Roberts and R. L. Tweedie. Geometric convergence and central limit theorems for multidimensional Hastings and Metropolis algorithms. (submitted for publication), 1994.

[225]Gareth O. Roberts and Nicholas G.Polson. A note on the geometric convergence of the gibbs sampler. *J. Roy. Statist. Soc. Ser. B*, 56:377–384, 1994.

[226]Z. Rosberg. A note on the ergodicity of Markov chains. *J. Appl. Probab.*, 18:112–121, 1981.

[227]M. Rosenblatt. Equicontinuous Markov operators. *Teor. Verojatnost. i Primenen*, 9:205–222, 1964.

[228]M. Rosenblatt. Invariant and subinvariant measures of transition probability functions acting on continuous functions. *Z. Wahrscheinlichkeitstheorie und Verw. Geb.*, 25:209–221, 1973.

[229]M. Rosenblatt. Recurrent points and transition functions acting on continuous functions. *Z. Wahrscheinlichkeitstheorie und Verw. Geb.*, 30:173–183, 1974.

[230]W. A. Rosenkrantz. Ergodicity conditions for two-dimensional Markov chains on the positive quadrant. *Prob. Theory and Related Fields*, 83:309–319, 1989.

[231]J. S. Rosenthal. *Rates of Convergence for Gibbs Sampler and Other Markov Chains.* PhD thesis, Harvard University, 1992.

[232]J. S. Rosenthal. Minorization conditions and convergence rates for Markov chain Monte Carlo. Technical Report 9321, Department of Statistics, University of Toronto, 1993.

[233]W. Rudin. *Real and Complex Analysis.* McGraw-Hill, New York, 2nd edition, 1974.

[234]S. H. Saperstone. *Semidynamical Systems in Infinite Dimensional Spaces.* Springer-Verlag, New York, 1981.

[235]L. I. Sennott, P. A. Humblet, and R. L. Tweedie. Mean drifts and the non-ergodicity of Markov chains. *Operations Res.*, 31:783–789, 1983.

[236]J. G. Shanthikumar and D. D. Yao. Second-order properties of the throughput of a closed queueing network. *Math. Operations Res.*, 13:524–533, 1988.

[237]M. Sharpe. *General Theory of Markov Processes.* Academic Press, New York, 1988.

[238]Z. Šidák. Classification of Markov chains with a general state space. In *Trans 4th Prague Conf. Inf. Theory Stat. Dec. Functions, Random Proc*, pages 547–571, Prague, 1967. Academia.

[239]K. Sigman. The stability of open queueing networks. *Stoch. Proc. Applns.*, 35:11–25, 1990.

[240]G. F. Simmons. *Introduction to Topology and Modern Analysis.* McGraw Hill, New York, 1963.

[241]R. Sine. Convergence theorems for weakly almost periodic Markov operators. *Israel J. Math.*, 19:246–255, 1974.

[242]R. Sine. On local uniform mean convergence for Markov operators. *Pacific J. Math.*, 60:247–252, 1975.

[243]R. Sine. Sample path convergence of stable Markov processes II. *Indiana University Math. J.*, 25:23–43, 1976.

[244]A. F. M. Smith and A. E. Gelfand. Bayesian statistics without tears: A sampling-resampling perspective. *Amer. Statist.*, 46:84–88, 1992.

[245]A.F.M. Smith and G.O. Roberts. Bayesian computation via the Gibbs sampler and related Markov chain Monte Carlo methods (with discussion). *J. Roy. Statist. Soc. Ser. B*, 55:3–23, 1993.

[246]A.F.M. Smith and G.O. Roberts. Simple conditions for the convergence of the Gibbs sampler and Hastings-Metropolis algorithms. *Stoch. Proc. Applns.*, (to appear):, 1994.

[247]W. L. Smith. Asymptotic renewal theorems. *Proc. Roy. Soc. Edinburgh (A)*, 64:9–48, 1954.

[248]W. L. Smith. Regenerative stochastic processes. *Proc. Roy. Soc. London (A)*, 232:6–31, 1955.

[249]W. L. Smith. Remarks on the paper “Regenerative stochastic processes”. *Proc. Roy. Soc. London (A)*, 256:296–301, 1960.

[250]J. Snyders. Stationary probability distributions for linear time-invariant systems. *SIAM J. Control and Optimization*, 15:428–437, 1977.

[251]V. Solo. Stochastic adaptive control and martingale limit theory. *IEEE Trans. Automat. Control*, 35:66–70, 1990.

[252]F. M. Spieksma. *Geometrically Ergodic Markov Chains and the Optimal Control of Queues.* PhD thesis, University of Leiden, 1991.

[253]F. M. Spieksma and R. L. Tweedie. Strengthening ergodicity to geometric ergodicity for Markov chains. *Stochastic Models*, 10: , 1994.

[254]F.M. Spieksma. Spectral conditions and bounds for the rate of convergence of countable Markov chains. Technical Report, University of Leiden., 1993.

[255]F. Spitzer. *Principles of random walk.* Van Nostrand, Princeton, NJ, 1964.

[256]L. Stettner. On the existence and uniqueness of invariant measures for continuous time Markov processes. Technical Report LCDS #86-18, Brown University, Providence, RI, 1986.

[257]A. Stolyar. On the stability of multiclass queueing networks. Technical report, March 1994. Submitted to the Proceedings of the Second Conference on Telecommunication Systems - Modelling and Analysis.

[258]C. R. Stone. On absolutely continuous components and renewal theory. *Ann. Math. Statist.*, 37:271–275, 1966.

[259]D. W. Stroock and S. R. Varadhan. On degenerate elliptic-parabolic operators of second order and their associated diffusions. *Comm. Pure Appl. Math.*, 25:651–713, 1972.

[260]D. W. Stroock and S. R. Varadhan. On the support of diffusion processes with applications to the strong maximum principle. In *Proceedings of the 6th Berkeley Symposium on Mathematical Statistics and Probability*, pages 333–368. University of California Press, 1972.

[261]W. Szpankowski. Some sufficient conditions for non-ergodicity of Markov chains. *J. Appl. Probab.*, 22:138–147, 1985.

[262]M. A. Tanner and W. H. Wong. The calculation of posterior distributions by data augmentation. *J. Amer. Statist. Assoc.*, 82:528–540, 1987.

[263]J. L. Teugels. An example on geometric ergodicity of a finite Markov chain. *J. Appl. Probab.*, 9:466–469, 1972.

[264]L. Tierney. Exploring posterior distributions using Markov chains. Technical Report 560, University of Minnesota, 1991.

[265]D. Tjøstheim. Non-linear time series and Markov chains. *Adv. Appl. Probab.*, 22:587–611, 1990.

[266]H. Tong. A note on a Markov bilinear stochastic process in discrete time. *J. Time Ser. Anal.*, 2:279–284, 1981.

[267]H. Tong. *Non-linear Time Series: A Dynamical System Approach.* Oxford University Press, Oxford, 1990.

[268]P. Tuominen. Notes on 1-recurrent Markov chains. *Z. Wahrscheinlichkeitstheorie und Verw. Geb.*, 36:111–118, 1976.

[269]P. Tuominen and R. L. Tweedie. Markov chains with continuous components. *Proc. London Math. Soc. (3)*, 38:89–114, 1979.

[270]P. Tuominen and R. L. Tweedie. The recurrence structure of general Markov processes. *Proc. London Math. Soc. (3)*, 39:554–576, 1979.

[271]P. Tuominen and R. L. Tweedie. Subgeometric rates of convergence of f-ergodic Markov chains. *Adv. Appl. Probab.*, 26:775–798, 1994.

[272]R. L. Tweedie. R-theory for Markov chains on a general state space I: solidarity properties and R-recurrent chains. *Ann. Probab.*, 2:840–864, 1974.

[273]R. L. Tweedie. R-theory for Markov chains on a general state space II: r-subinvariant measures for r-transient chains. *Ann. Probab.*, 2:865–878, 1974.

[274]R. L. Tweedie. Relations between ergodicity and mean drift for Markov chains. *Austral. J. Statist.*, 17:96–102, 1975.

[275]R. L. Tweedie. Sufficient conditions for ergodicity and recurrence of Markov chains on a general state space. *Stoch. Proc. Applns.*, 3:385–403, 1975.

[276]R. L. Tweedie. Criteria for classifying general Markov chains. *Adv. Appl. Probab.*, 8:737–771, 1976.

[277]R. L. Tweedie. Operator geometric stationary distributions for Markov chains with applications to queueing models. *Adv. Appl. Probab.*, 14:368–391, 1981.

[278]R. L. Tweedie. Criteria for rates of convergence of Markov chains with application to queueing and storage theory. In J. F. C. Kingman and G. E. H. Reuter, editors, *Probability, Statistics and Analysis.* London Mathematics Society Lecture Note Series, Cambridge University Press, Cambridge, 1983.

[279]R. L. Tweedie. The existence of moments for stationary Markov chains. *J. Appl. Probab.*, 20:191–196, 1983.

[280]R. L. Tweedie. Invariant measures for Markov chains with no irreducibility assumptions. *J. Appl. Probab.*, 25A:275–285, 1988.

[281]D. Vere-Jones. Geometric ergodicity in denumerable Markov chains. *Quart. J. Math. Oxford (2nd Ser.)*, 13:7–28, 1962.

[282]D. Vere-Jones. A rate of convergence problem in the theory of queues. *Theory Probab. Appl.*, 9:96–103, 1964.

[283]D. Vere-Jones. Ergodic properties of nonnegative matrices I. *Pacific J. Math.*, 22:361–385, 1967.

[284]D. Vere-Jones. Ergodic properties of nonnegative matrices II. *Pacific J. Math.*, 26:601–620, 1968.

[285]B. E. Ydstie. Bifurcations and complex dynamics in adaptive control systems. In *Proceedings of the 25th Conference on Decision and Control*, Athens, Greece, 1986.

[286]K. Yosida and S. Kakutani. Operator-theoretical treatment of Markov's process and mean ergodic theorem. *Ann. Math.*, 42:188–228, 1941.