

Publications, presentations and patents

1. Books

Kingsford DPW, Liley DTJ. A System of Physical Examination. McGraw Hill, Sydney. 1991.

2. Book Chapters & Reference Book Entries

Liley DTJ, Bojak I, Foster BL. Co-operative populations of neurons: mean field models of mesoscopic brain activity. In N. Le Novère and U. Bhalla (editors), Computational Systems Biology. Springer, New York 2011 (in preparation)

Liley DTJ, Bojak I, Foster BL. A mesoscopic modelling approach to characterising anaesthetic action on brain electrical activity. In A. Hutt (editor), Sleep and anesthesia: Neural correlates in theory and experiment. Springer, New York. 2010 (in press)

Liley DTJ, Frascoli F. Approaches to modeling the dynamical activity of brain function based on the electroencephalogram. In R.L. Dewar and F Detering (editors), Complex Physical, Biophysical and Econophysical Systems. World Scientific, Singapore. 2010. ISBN 978-981-4277-31-0.

Liley DTJ, Bojak I, Dafilis MP, van Veen L, Frascoli F and Foster B. Bifurcations and state changes in the human alpha rhythm: theory and experiment. In A. Steyn-Ross and M Steyn-Ross (editors), Modeling Phase Transitions in Brain Activity. Springer, New York. 2009. ISBN 978-1-4419-0795-0

Liley DTJ, Dafilis MP. Electroencephalogram at mesoscopic scales. In A.C. Scott, Encyclopedia Of Nonlinear Science. Fitzroy Dearborn, London. 2005.

Liley DTJ, Cadusch PJ, Wright JJ. A continuum theory of electro-cortical activity. In J.M. Bower Computational Neuroscience: Trends in Research 1999. Elsevier Science, Amsterdam. 1999.

Liley DTJ. A continuum model of the mammalian alpha rhythm. In F.L. Silva, J.C. Principe and L.B. Almeida (eds) Spatiotemporal Models in Biological and Artificial Systems, pages 89-96. IOS Press, Amsterdam. 1997.

3. Articles (journals & refereed proceedings)

Frascoli F, van Veen L, Bojak I, Liley DTJ. Meta-bifurcation analysis of a mean field model of cortical neuronal activity. *Physica D* (submitted 2010)

Dafilis MP, Sinclair NC, Cadusch PJ, Liley DTJ. Re-evaluating the performance of the nonlinear prediction error for the detection of deterministic dynamics. *Physica D* (submitted 2010)

Liley DTJ, Sinclair NC, Lipping T, Heyse B, Vereecke HEM, Struys MMRF. Propofol and remifentanyl differentially modulate frontal electroencephalographic activity. *Anesthesiology* 2010 113: 292-304. (accompanied by the editorial Sleight J. Disentangling Hypnos from his poppies. *Anesthesiology* 113:271-272.

Bojak I, Liley DTJ. Axonal velocity distributions in neural field equations. *PLoS Comput Biol* 2010 6(1): e1000653. doi:10.1371/journal.pcbi.1000653

Dafilis MP, Frascoli F, Cadusch PJ and Liley DTJ. Chaos and generalized multistability in a mesoscopic model of the electroencephalogram. *Physica D* 2009 238:1056-1060.

White D, Ciorciari J, Carbis C, Liley D. EEG correlates of virtual reality hypnosis. *International Journal of Clinical and Experimental Hypnosis* 2009 57(1):94-116

Frascoli F, Dafilis MP, van Veen L, Bojak I and Liley DTJ. Dynamical complexity in a mean field model of human EEG. *Proc. SPIE* 7270, 72700V 2008, DOI:10.1117/12.813966

Liley DTJ, Leslie K, Sinclair N, Feckie M. Dissociating the effects of nitrous oxide on brain electrical activity using fixed order time series modeling. *Computers in Biology and Medicine* 2008 38:1121-1130.

Foster BJ, Bojak I, Liley DTJ. Population Based Models of Cortical Drug Response - Insights from Anaesthesia: Review. *Cognitive Neurodynamics* 2008 2(4):283-96

- Foster BL, Bojak I, Liley DTJ. EEG dynamics during nitrous oxide inhalation in healthy male participants in R Wang, F Gu & E Shen (eds) *Advances in Cognitive Neurodynamics ICCN 2007*. Springer, New York. 2008.
- Coombes S, Venkov NA, Shiao L, Bojak I, Liley DT, Laing CR. Modeling electrocortical activity through improved local approximations of integral neural field equations. *Physical Review E* 2007 76:051091.
- Bojak I and Liley DTJ. Self-organized 40 Hz synchronization in a physiological theory of EEG. *Neurocomputing* 2007 70:2085-2090.
- Van Veen L, Liley DTJ. Chaos via Shilnikovs saddle node bifurcation in a theory of the electroencephalogram. *Physical Review Letters* 2006 97:208101.
- Liley DTJ, Bojak I. Understanding the transition to seizure by modelling the epileptiform activity of general anaesthetic agents. *Journal of Clinical Neurophysiology* 2005;22:300-13.
- Bojak I, Liley DTJ. Modelling the effects of anaesthesia on the electroencephalogram. *Physical Review E* 2005;71: 041902.
- Lu K, Gray MA, Oliver C, Liley DT, Harrison BJ, Bartholomeusz CF, Phan KL, Nathan PJ. The acute effects of L-theanine in comparison with alprazolam on anticipatory anxiety in humans. *Human Psychopharmacology* 2004;19: 457-65.
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- Bojak I, Liley DTJ, Cadusch PJ, Cheng K. Electrorhythmogenesis and anaesthesia in a physiological mean field theory. *Neurocomputing* 2004;50-60:1197-1203.
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- Calvisi ML, Szeri AJ, Liley DTJ, Ferree TC. Theoretical study of BOLD response to sinusoidal input. In: *Proceedings of 25th Annual Conference of the IEEE Engineering in Medicine and Biology Society* 2004:659-662.
- Liley DTJ, Cadusch PJ, Gray M, Nathan PJ. Drug-induced modification of the system properties associated with spontaneous human electroencephalographic activity. *Physical Review E* 2003;68: 051906.
- Liley DTJ, Cadusch PJ, Dafilis MP. Corrigendum: A spatially continuous mean field theory of electrocortical activity. *Network-Computation in Neural Systems* 2003;14;369.
- Dafilis MP, Bourke PD, Liley DTJ, Cadusch PJ. Visualising chaos in a model of brain electrical activity. *Computers and Graphics* 2002;26:971-976.
- Liley DTJ, Cadusch PJ, Dafilis MP. A spatially continuous mean field theory of electrocortical activity. *Network-Computation in Neural Systems* 2002;13:67-113.
- Dafilis MP, Liley DTJ, Cadusch PJ. Robust chaos in a model of the electroencephalogram: Implications for brain dynamics. *Chaos* 2001;11:474-478.
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- Liley DTJ. Book Review: *Fast Oscillations in Cortical Circuits* by Roger D. Traub, John G. R. Jefferys and Miles A. Whittington The MIT Press, Cambridge MA, 1999. *International Journal of Neural Systems* 2000;10:155-157.
- Steyn-Ross ML, Steyn-Ross DA, Sleigh JW, Liley DTJ. Theoretical electroencephalogram stationary spectrum for a white-noise-driven cortex: Evidence for a general anesthetic induced phase transition. *Physical Review E* 1999;60:7299-7311.
- Liley DTJ, Cadusch PJ, Wright JJ. A continuum theory of electro-cortical activity. *Neurocomputing* 1999;26-27:795-800.
- Liley DTJ, Alexander DM, Wright JJ, Aldous MM. Alpha rhythm emerges from large scale networks of realistically coupled multicompartmental model cortical

neurons. *Network-Computation in Neural Systems* 1999;10:79-82.

Wright JJ, Liley DTJ. Dynamics of the brain at global and microscopic scales: Neural networks and the EEG. *Behavioral and Brain Sciences* 1996;19:285-295.

Wright JJ, Liley DTJ. Multiscale modeling of brain dynamics depends upon approximations at each scale. *Behavioral and Brain Sciences* 1996;19:310-316.

Liley DTJ, Wright JJ. Corrigendum: Intracortical connectivity of pyramidal and stellate cells: Estimates of synaptic densities and coupling symmetry. *Network-Computation in Neural Systems* 1995;6:103-104.

Wright JJ, Liley DTJ. Simulation of electrocortical waves. *Biological Cybernetics* 1995;72:347-356.

Wright JJ, Kydd RR, Liley DTJ. On integrating chaotic and linear models of electrocortical activity. *Psychology* 1994;4(60).

Wright JJ, Kydd RR, Liley DTJ. Noise is crucial to EEG dynamics. *Psychology* 1994; 5(19).

Wright JJ, Kydd RR, Liley DTJ. EEG simulation is not metaphor. *Psychology* 1994; 5(24).

Liley DTJ, Wright JJ. Intracortical connectivity of pyramidal and stellate cells: Estimates of synaptic densities and coupling symmetry. *Network-Computation in Neural Systems* 1994;5: 175-189.

Wright JJ, Liley DTJ. A millimetric scale simulation of electrocortical wave dynamics based on anatomical estimates of cortical synaptic density. *Network-Computation in Neural Systems* 1994;5:191-202.

Wright JJ, Sergejew AA, Liley DTJ. Computer simulation of electrocortical activity at millimetric scale. *Electroencephalography and Clinical Neurophysiology* 1994;90:365-375.

Liley DTJ, Wiggins PM, Baguley BC. Localization of a nonintercalative DNA binding antitumour drug in mitochondria: relationship to multidrug resistance. *European Journal of Cancer and Clinical Oncology* 1989;25:1287-93.

4. Selected conference abstracts

Foster B, Dafilis M, Cadusch P, Liley DTJ. Modulation of resting EEG nonlinear topography by NMDA receptor antagonist nitrous oxide. *Human Brain Mapping 2008, Melbourne, Australia.*

Liley DTJ, Dafilis M, Foster B, Cadusch P. Macroscopic state transitions in electroencephalographic dynamics. *Human Brain Mapping 2008, Melbourne, Australia.*

Sinclair N, Bugler S, Delectretaz L, Leslie K, Liley D. Physiologically causal analysis of the human electroencephalogram using fixed order autoregressive moving average modeling. *Human Brain Mapping 2008, Melbourne, Australia.*

Takeichi H, Koyama S, Foster B, Liley D. A coherence analysis of EEG responses to speech modulated by m-sequence. *15th Cognitive Neuroscience Society Meeting 2008, San Francisco, USA.*

Foster BL, Dafilis MP, Sinclair NC, Liley DTJ. EEG dynamics during nitrous oxide inhalation in healthy male participants (3-01-0009). *1st International Conference on Cognitive Neurodynamics 2007, Shanghai, China.*

Takeichi H, Koyama S, Cichocki A, Foster B, Liley D. An EEG coherence analysis of fMRI data on speech comprehension (bm-52). *Workshop on Mechanisms of Brain and Mind 2007, Sapporo, Japan.*

Ferree T, Wade A, Calvisi M, Szeri A, Liley D, Inglis B, Norcia T. Experimental study of EEG and bold responses to sinusoidal contrast modulation. *IEEE Engineering in Medicine and Biology Workshop 2007, Dallas, USA.*

Bojak I and Liley DTJ. Self-organized 40 Hz synchronization in a physiological theory of EEG. *The Annual Computational Neuroscience Meeting 2006, Edinburgh, UK.*

Bojak I, Liley DTJ, Cadusch P and Cheng K. □Electrorhythmogenesis and anaesthesia in a physiological mean field theory. *The Annual Computational Neuroscience Meeting 2003, Alicante, Spain.*

5. Selected seminars and invited presentations

Progress in Neural Field Theory, Centre for Integrative Neuroscience and Neurodynamics, University of Reading, 16-18/09/2010. (invited)

Mathematical Neuroscience Workshop, Royal Society of Edinburgh, 19/03/2008, "Macroscopic state transitions in electroencephalographic dynamics" (invited)

British Theoretical Neuroscience Research Network, Bristol, 14/09/2007, "Noise, non-linearity and the alpha rhythm: progress towards a unified dynamical explanation of the electroencephalogram" (invited)

Helen Wills Neuroscience Institute, University of California at Berkeley, 12/07/2006, "Brain Dynamics and the Electroencephalogram" (invited)

Functional Imaging Laboratory, Institute of Neuroscience, University College London, 17/07/2006, "Brain Dynamics and the Electroencephalogram" (invited)

Division of Biology, Polish Academy of Sciences, Warsaw, Poland, 24/07/2006, "Brain Dynamics and the Electroencephalogram" (invited)

Division of Biology, California Institute of Technology, 01/08/1998, "A theory of the human alpha rhythm" (invited)

6. Patents

D. Liley, "Method of monitoring brain function"
Australian Patent Application Number: 2004206763,
European Patent Application Number: EP F 04701863
A, New Zealand Patent Application Number: 541615,
Japanese Patent Application number: 2006-500406,
US Patent Application number: 10/542549

D. Liley, Louis Delacretaz, "Brain Function Monitoring and Display System", Australian Patent Application Number: 2007257335, European Patent Application Number: 07719043.7, Japanese Patent Application Number: 2009-513516, New Zealand Patent Application Number: 573460, Chinese Patent Application Number: 200780027482.8, US Patent Application Number: 12/303734, International Patent Application Number: PCT/AU2007/000800

David Liley, "EEG analysis system", Australian Patent Application Number: 2007257336, European Patent Application Number: 07719044.5, Japanese Patent Application Number: 2009-513517, New Zealand Patent Application Number: 573459
Chinese Patent Application Number: 200780027483.2,
US Patent Application Number: 12/303736,
International Patent Application Number:
PCT/AU2007/000801

David Liley, "Neurodiagnostic monitoring and display system", Australian Patent Application Number: 2007324331, European Patent Application Number: 07815566.0, US Patent Application Number: 12/515909, International Patent Application Number: PCT/AU2007/001763