

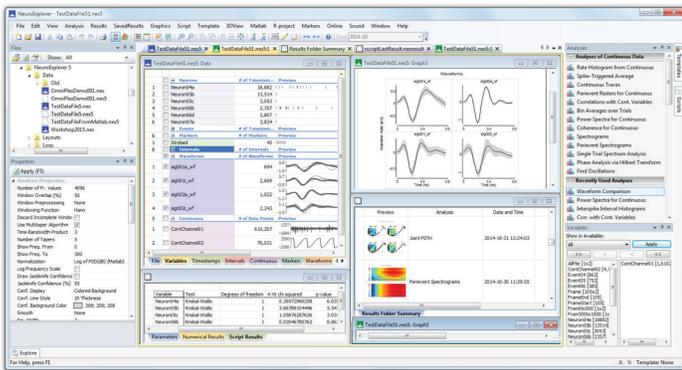


JULY 30, 2015

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NEUROEXPLORER 5.017, 120 CHINESE RESEARCHERS, 2016 WORKSHOP DATES, DURA PENETRATION WITH PROBES AND MORE!

SAVE HUGE FILES WITH NEUROEXPLORER V5.017 - NEW RELEASE



NeuroExplorer® - the undisputed industry gold standard in neural data analysis programs cited by more than 2,100 scientific publications – releases v5.017 enabling maximum flexibility when working with and saving neural data files greater than 2 GB and a new “Find Oscillations” analysis.

NeuroExplorer launched its new .NEX5 file format last year to meet the growing data demands of the industry. This most recent release leverages the increased flexibility of the .NEX5 format not only to analyze and save extra large files, but also to save unlimited metadata for the whole file and for every file variable in JSON format.

The main structure of the .NEX and .NEX5 file types is the same. The file starts with the file header followed by the variable headers containing data offsets. Binary data arrays are written after all the headers. The .NEX5 headers contain minimum information needed to store, load and properly interpret data. The metadata that is less often used in analysis (for example, recording start time, recording software, electrode location, etc.) is stored in a string at the end of the file after all the binary data. Most importantly, the upper file size limit of 2 GB has been removed all together.

Another important advance in this release includes the “Find Oscillations” analysis which identifies episodes of oscillatory activity in the specified frequency band in recorded analog signals. The algorithm

is described in Klausberger, Magill, Marton, Roberts, Cobden, Buzsaki and Somogyi. *Brain-state- and cell-type-specific firing of hippocampal interneurons in vivo.* *Nature*, 2003 Feb 20;421(6925):844-8. The user specifies two frequency bands (for example, theta band and delta band). NeuroExplorer finds the segments of LFP signal where theta to delta frequency power ratio exceeds a certain threshold. The LFP signal is band-filtered and oscillation cycle start times are identified via Hilbert transform. This analysis adds several new variables to the data file.

This latest release is available online at no charge for anyone with a NeuroExplorer v5 license key. Additionally, researchers will find supporting files for use with C++ and MATLAB® in the same location. More information can be found on the NeuroExplorer webpage or contact info@plexon.com.

CHINA WORKSHOP WELCOMES 120 RESEARCHERS – AND A SPECIAL GUEST!

Plexon congratulates Hong Kong Plexon Limited on the success of their 3rd China Regional Neuroscience Workshop that ran from July 21-23, 2015 resulting in the largest turnout yet – with a surprise guest appearance.

Last week, the 2015 workshop held at the Peking University Health Science Center in Beijing attracted 30% greater attendance from 10% more labs - breaking last year's record numbers. Nearly 120 attendees representing 56 laboratories from across the country joined in for the intense event featuring lecture style presentations followed by hands-on application.

The 2015 China Regional Neuroscience Workshop offered three full days of instruction including expert training with the OmniPlex® Neural Data Acquisition System, CinePlex® Behavioral Research System, PlexBright® Optogenetic Stimulation System, PlexStim™ Electrical Stimulation System, NEW Offline Sorter™ v4 Offline Neural Spike Sorting Software, the NeuroExplorer v5 Neural Data Analysis Software, U-Probes and other electrodes, and animal surgery guidance.

Attendees were honored to hear from special guest speakers Professor Pei from Institute of Semiconductors, CAS; Dr. Lai from Zhejiang University; Dr. Gu from Institute of Neuroscience, CAS; Dr. Lu from Shenzhen Institute of Advanced Technology, CAS; and Professor Yuji Naya from Peking University. Speakers kindly shared a wealth of guidance and experience on product topics and their own research applications. Additionally, the attendees were treated to a special guest appearance made by Plexon Inc's founder and president, Harvey W. Wiggins. He made the special trip to share his vision for the future of the company before visiting various labs in the region.

Congratulations once again to Hong Kong Plexon Limited, and thank you to all participating researchers! This was the largest and most successful China Regional Neuroscience Workshop to date! For the group picture, visit the official news release.

Hong Kong Plexon Limited is Plexon's distribution partner in China and Korea. For more information regarding product sales or future workshops in China or Korea, contact jerry@plexon.com.hk.

SAVE THE DATE - 7TH ANNUAL PLEXON WORKSHOP

Mark your calendars! Plexon's 7th Annual Neurophysiology and Behavior Workshop has been set for the week of April 11, 2016. It will once again be held in Dallas, Texas, USA with limited seating.

As previous attendees can attest, the Plexon Workshop is not a sales event in any way, shape or form – and it is not for the faint! The Workshop is a nearly-exhausting, intense, multi-day, hands-on, fully exercise-based training event with group sessions and one-on-one coaching. Spend a few days with us and watch the quality, depth and efficiency of your lab's data recording, video tracking and analysis significantly improve.

See how Angela Chen from FORUM Pharmaceuticals describes her Plexon Workshop experience later in this newsletter – and how it saved her team almost \$50,000!

For information regarding the upcoming Workshop or special pricing, email workshop@plexon.com.

DID YOU KNOW . . . HOW TO PROTECT YOUR U- OR V-PROBE WHEN PENETRATING THE DURA?

Plexon's U-Probes and V-Probes are capable of recording in the rodent brain, as well as both deep and superficial brain structures in the primate brain. The procedure for safely penetrating the dura is different for each situation. It is very important to strictly adhere to these procedures to avoid damaging the tip of your probe.

Choose a sharpened guide tube that has an inner diameter that is 100-200 µm larger than the outer diameter of the thin section of the probe you are using. Only the thin section of the probe should enter the guide tube - not the reinforcement tube near the connector.

For targeting deep structures in the primate brain, first insert a sharpened guide tube through the dura and into the brain. The probe should be safely inside the guide tube during this procedure. Then pass the probe through the sharpened guide tube.

For targeting primate superficial cortex, insert a sharpened guide tube partially into the dura, but without puncturing the dura. Then pass the probe through the end of the guide tube and attempt to push through the dura. View the thin section of the probe that is visible above the guide tube during this process. If you see bending or flexing, stop immediately and pull back the probe as this is a sign that the dura is too thick and hard for the probe to pass.

For targeting structures in rodent brain in acute, head-fixed recordings, make a craniotomy. You may or may not wish to remove the dura surface. Then pass the probe vertically into the brain under stereotaxic control.

For more information regarding dura penetration with Plexon probes, consult the probe-specific technical guide under the Electrodes header on the Documentation webpage. Feel free to contact support@plexon.com at any time with questions.

PLEXON WORKSHOP ALUMNI SPEAK OUT: ANGELA CHEN

"I found the workshop experience to be absolutely invaluable, not only for educational purposes, but also for networking and building relationships with Plexon experts and also fellow users. I learned NeuroExplorer v5 tools that made analysis much more efficient, and I was able to use them immediately when I got back from the workshop and could share with my colleagues. I was also able to tap fellow users for their insight and expertise.

On a more practical front, I learned some basic hardware information at the meeting that allowed me to expand our current capabilities and save our company ~\$47,000!"

Angela Chen

FORUM Pharmaceuticals

FREE PLEXSTIM™ FIRMWARE UPGRADES

Reminder to existing users of the PlexStim™ Electrical Stimulator: PlexStim Software v2.3 requires a FREE firmware upgrade to benefit from the new functionality as well as improved reliability and enhanced electrical isolation. Email support@plexon.com to take advantage of the offer.

FREE OFS V4 UPGRADES FOR 2015 V3 ORDERS

Just a reminder to those labs who purchased new licenses of OFS v3 in 2015 prior to April 23 - you are entitled to a FREE upgrade to OFS v4. Email info@plexon.com for more information. Offer expires on December 21, 2015.

70% OFS V4 UPGRADE DISCOUNTS FOR Q4, 2014 V3 ORDERS

Just a reminder to those labs who purchased new licenses of OFS v3 between Oct. 1 and Dec. 31, 2014 - you are entitled to 70% off of the standard OFS v4 upgrade. Email info@plexon.com for more information and/or a quote. Offer expires on December 21, 2015.

PLEXON KEEPS HIRING!

We keep growing and are constantly seeking outstanding, neuroscience-loving candidates for the following roles:

- Electrophysiology Sales
- Behavioral Neuroscience Sales
- Inside Sales for Neuroscience
- Senior Windows Software Engineer for Neuroscience

We especially encourage students and lab technicians from neuroscience and behavior research labs to apply. If you are interested, send your resume to jobs@plexon.com.

OFFICE CLOSURES

In observation of Labor Day in the United States, Plexon's world headquarters will be closed Monday, September 7th. Standard operations will resume Tuesday, September 8th.

RESEARCH SPOTLIGHT

Let us know about your 2015 publication citing Plexon and our equipment and we will send you a thank you award with a mug and a T-shirt! Send notices, address and T-shirt size to publications@plexon.com.

All articles listed are alphabetical based on first author within two categories: articles published online in electronic-only journals or ahead of print, and articles published in full print.

Recent articles published online in electronic-only journals or ahead of print:

- Alexander, Andrew S., and Douglas A. Nitz. "Retrosplenial cortex maps the conjunction of internal and external spaces." *Nature Neuroscience* (2015).
- Bellay, Timothy, Andreas Klaus, Saurav Seshadri, and Dietmar Plenz. "Irregular spiking of pyramidal neurons organizes as scale-invariant neuronal avalanches in the awake state." *eLife* 4 (2015): e07224.
- Boehler, C., T. Stieglitz, and M. Asplund. "Nanostructured platinum grass enables superior impedance reduction for neural microelectrodes." *Biomaterials* (2015).
- Ewert, Tobias AS, Johannes Möller, Andreas K. Engel, and Christiane Vahle-Hinz. "Wideband phase locking to modulated whisker vibration point to a temporal code for texture in the rat's barrel cortex." *Experimental Brain Research* (2015): 1-14.
- Fitzgerald, Paul J., Thomas F. Giustino, Jocelyn R. Seemann, and Stephen Maren. "Noradrenergic blockade stabilizes prefrontal activity and enables fear extinction under stress." *Proceedings of the National Academy of Sciences* (2015): 201500682.
- Kim, Yunbok, Nicholas W. Simon, Jesse Wood, and Bitu Moghaddam. "Reward anticipation is encoded differently by adolescent ventral tegmental area neurons." *Biological Psychiatry* (2015).
- Kumbhare, Deepak, Kunal D. Chaniary, and Mark S. Baron. "Preserved dichotomy but highly irregular and burst discharge in the basal ganglia in alert dystonic rats at rest." *Brain Research* (2015).

- Lee, Kwan Yeop, and Steven A. Prescott. "Chloride dysregulation and inhibitory receptor blockade yield equivalent disinhibition of spinal neurons yet are differentially reversed by carbonic anhydrase blockade." *PAIN* (2015).
- McCall, Jordan G., Ream Al-Hasani, Edward R. Siuda, Daniel Y. Hong, Aaron J. Norris, Christopher P. Ford, and Michael R. Bruchas. "CRH Engagement of the Locus Coeruleus Noradrenergic System Mediates Stress-Induced Anxiety." *Neuron* (2015).
- Moorman, David E., and Gary Aston-Jones. "Prefrontal neurons encode context-based response execution and inhibition in reward seeking and extinction." *Proceedings of the National Academy of Sciences* (2015): 201507611.
- Pais-Vieira, Miguel, Gabriela Chiuffa, Mikhail Lebedev, Amol Yadav, and Miguel AL Nicolelis. "Building an organic computing device with multiple interconnected brains." *Scientific Reports* 5 (2015).
- Parker, Krystal Lynn, Kuan-Hua Chen, Johnathan R. Kingyon, James F. Cavanagh, and Nandakumar S. Naryanan. "Medial frontal ~ 4 Hz activity in humans and rodents is attenuated in PD patients and in rodents with cortical dopamine depletion." *Journal of Neurophysiology* (2015): jn-00412.
- Ramakrishnan, Arjun, Peter J. Ifft, Miguel Pais-Vieira, Yoon Woo Byun, Katie Z. Zhuang, Mikhail A. Lebedev, and Miguel AL Nicolelis. "Computing arm movements with a monkey brainet." *Scientific Reports* 5 (2015).
- Scholes, Chris, Alan R. Palmer, and Christian J. Sumner. "Stream segregation in the anesthetized auditory cortex." *Hearing Research* (2015).
- Stoelzel, Carl R., Joseph M. Huff, Yulia Bereshpolova, Jun Zhuang, Xiaojuan Hei, Jose-Manuel Alonso, and Harvey A. Swadlow. "Hour-long adaptation in the awake early visual system." *Journal of Neurophysiology* (2015): jn-00116.
- Wang, Guo-Qiang, Cheng Cen, Chong Li, Shuai Cao, Ning Wang, Zheng Zhou, Xue-Mei Liu et al. "Deactivation of excitatory neurons in the prelimbic cortex via Cdk5 promotes pain sensation and anxiety." *Nature Communications* 6 (2015).

Recent articles published in full print:

- Agarwal, Rahul, Nitish V. Thakor, Sridevi V. Sarma, and Steve G. Massaquoi. "PMv Neuronal Firing May Be Driven by a Movement Command Trajectory within Multidimensional Gaussian Fields." *The Journal of Neuroscience* 35, no. 25 (2015): 9508-9525.
- Drucker, Caroline B., Monica L. Carlson, Koji Toda, Nicholas K. DeWind, and Michael L. Platt. "Non-invasive primate head restraint using thermoplastic masks." *Journal of Neuroscience Methods* 253 (2015): 90-100.
- Hansen, Bryan J., and Valentin Dragoi. "Adaptive Coding in Visual Cortical Circuits." *In Recent Advances on the Modular Organization of the Cortex*, pp. 297-312. Springer Netherlands, 2015.
- Pan, Wei-Xing, and Joshua T. Dudman. "A Specific Component of the Evoked Potential Mirrors Phasic Dopamine Neuron Activity during Conditioning." *The Journal of Neuroscience* 35, no. 29 (2015): 10451-10459.
- Song, Dong, Robert E. Hampson, Brian S. Robinson, Ioan Opris, Vasilis Z. Marmarelis, Sam A. Deadwyler, and Theodore W. Berger. "Nonlinear dynamical modeling of human hippocampal CA3-CA1 functional connectivity for memory prostheses." *In Neural Engineering (NER), 2015 7th International IEEE/EMBS Conference on*, pp. 316-319. IEEE, 2015.
- Xu, Zhiming, Cuntai Guan, Rosa Q. So, Kai Keng Ang, and Kyaw Kyar Toe. "Motor cortical adaptation induced by closed-loop BCI." *In Neural Engineering (NER), 2015 7th International IEEE/EMBS Conference on*, pp. 21-24. IEEE, 2015.
- Zordan, Stefano, Matteo Zanotto, Thierry Nieuws, Stefano Di Marco, Hayder Amin, Alessandro Maccione, and Luca Berdondini. "A scalable high performance client/server framework to manage and analyze high dimensional datasets recorded by 4096 CMOS-MEAs." *In Neural Engineering (NER), 2015 7th International IEEE/EMBS Conference on*, pp. 968-971. IEEE, 2015.