



26-29 Nov, 2014
Nimes, France



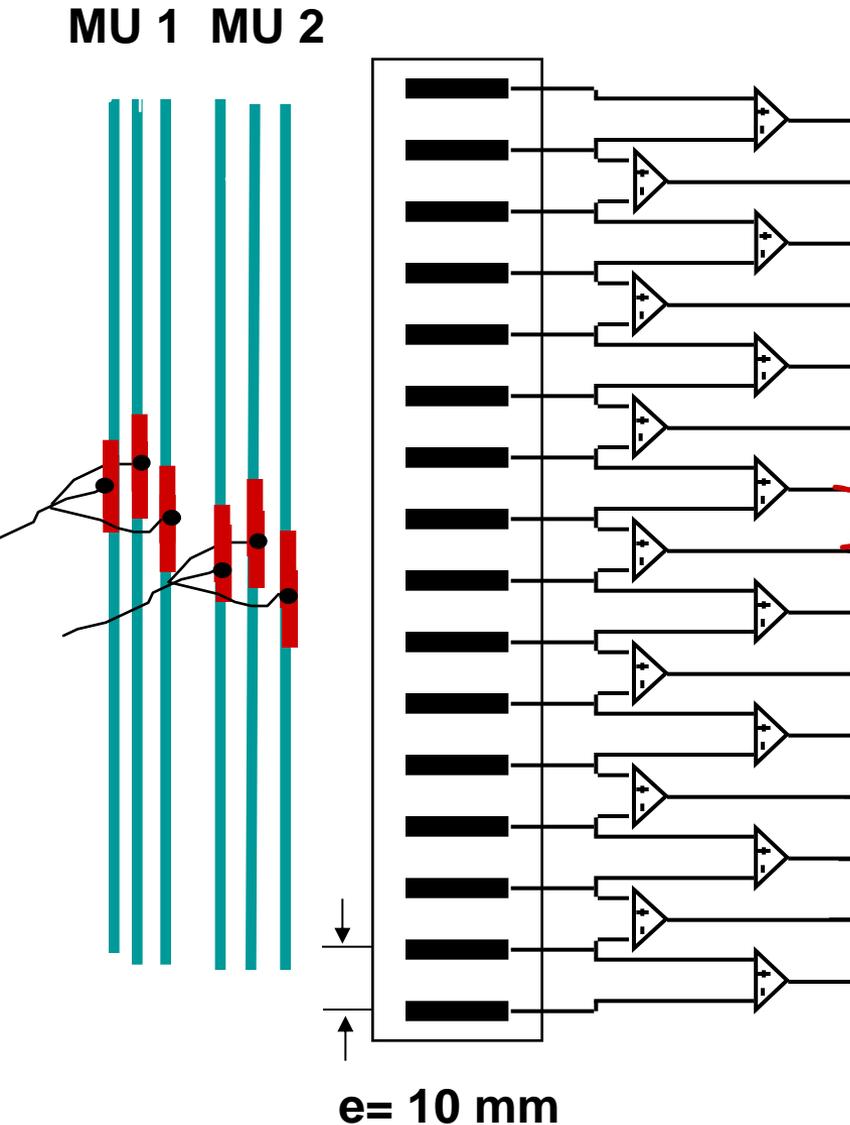
A Graphical User Interface for Automatic Detection and Visualization of Motor Unit Innervation Zones of External Anal Sphincter from Multi-channel sEMG

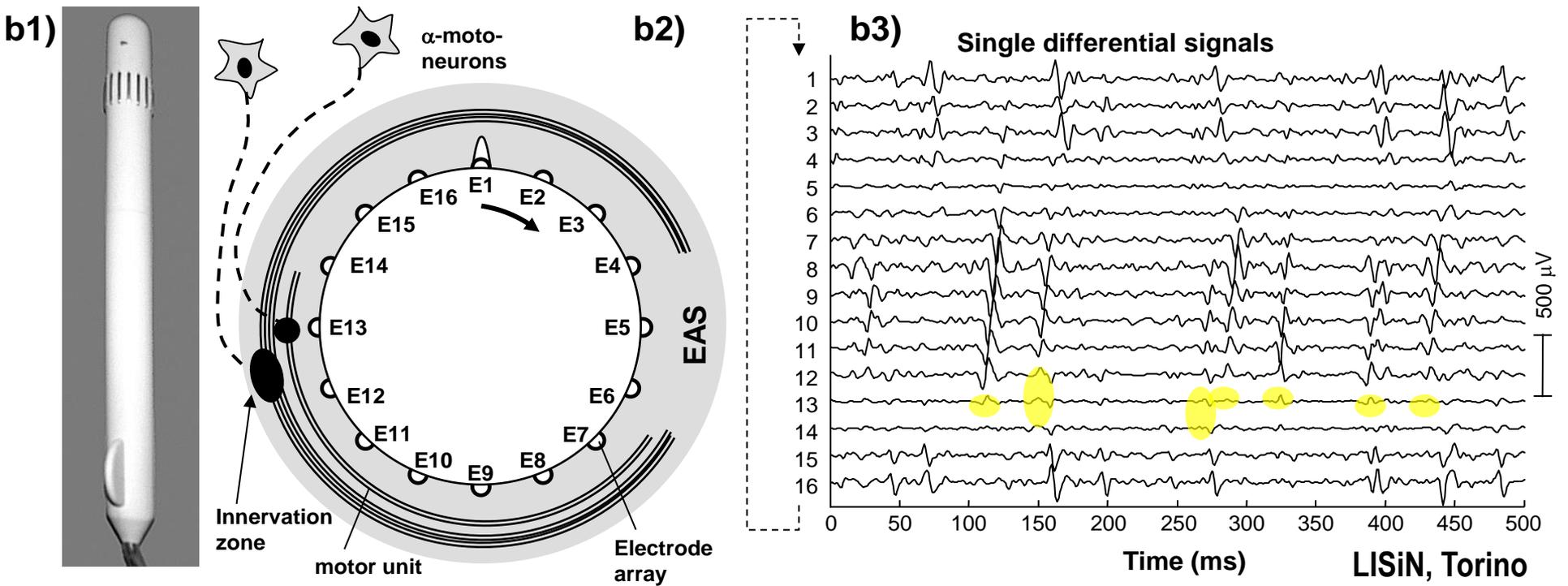
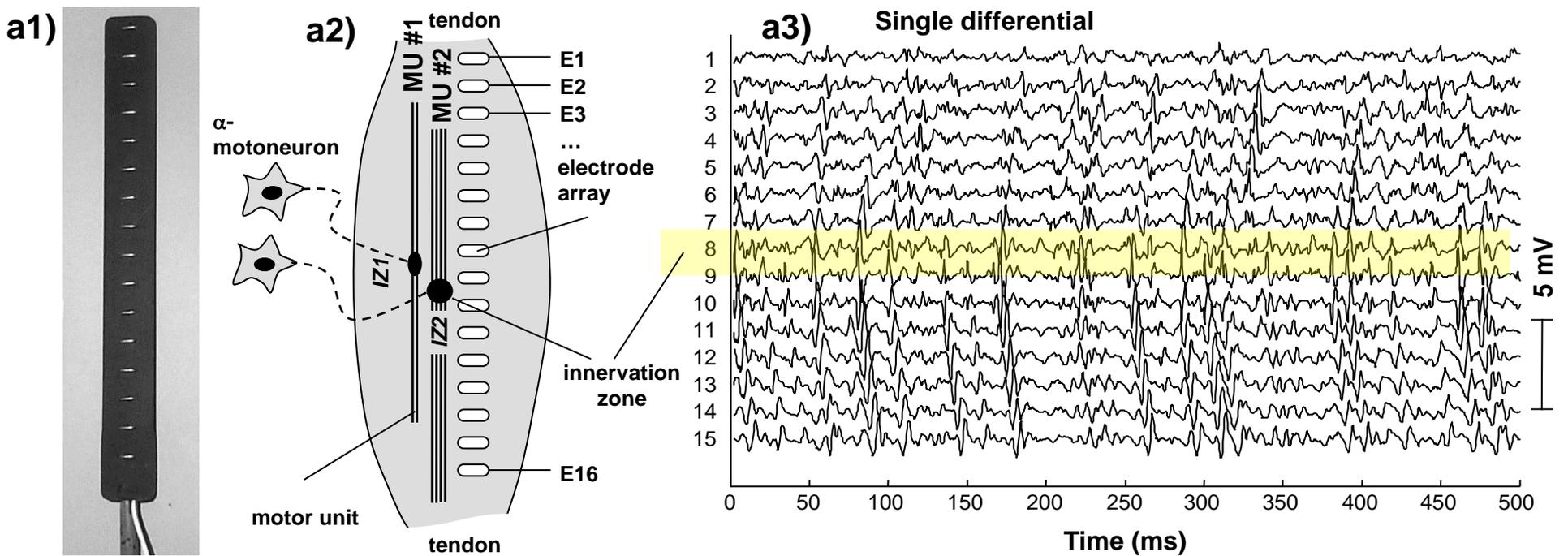
Ullah K, Merletti R

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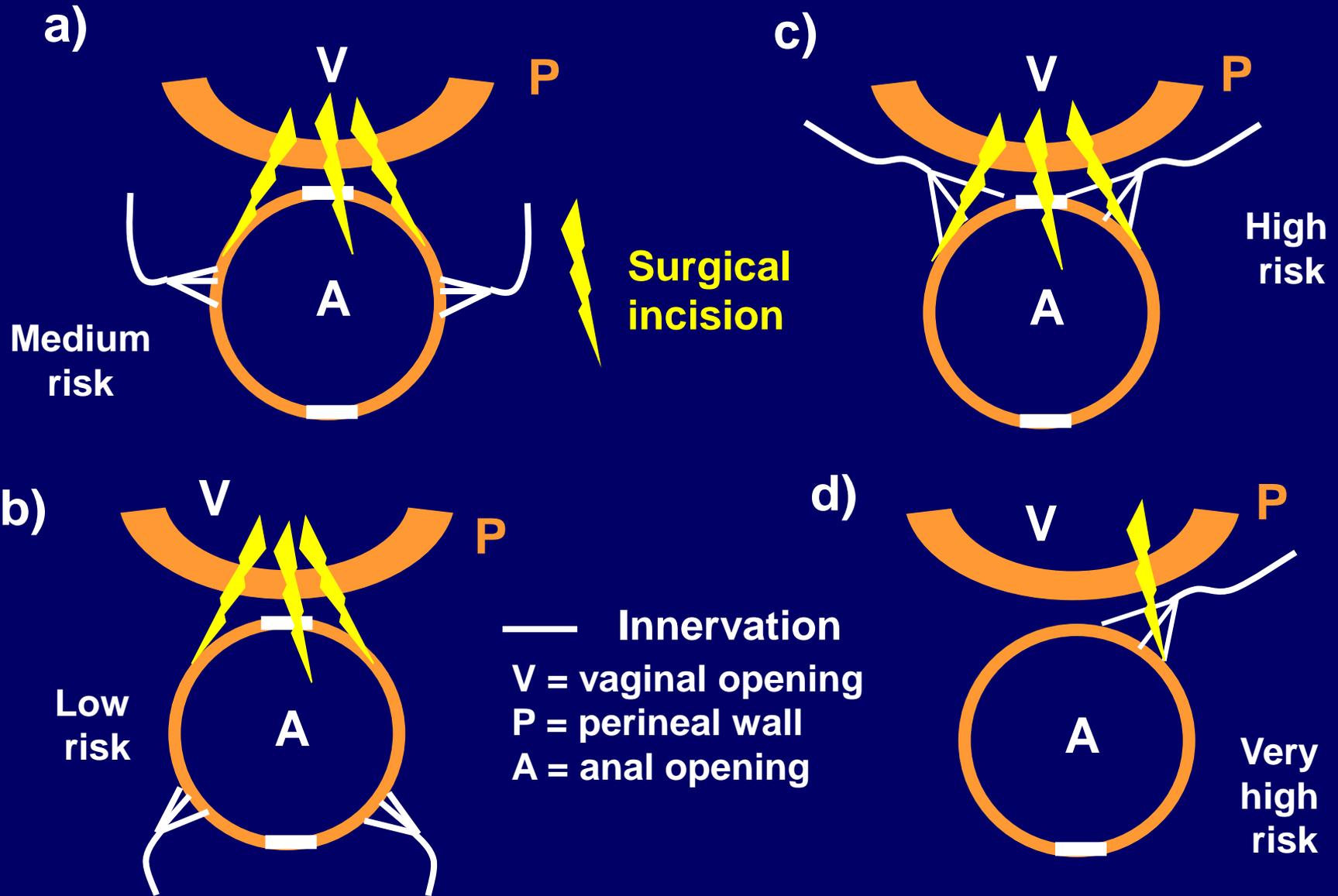
Propagation of the motor unit action potentials (MUAP) of two motor units under a linear electrode array aligned with the fiber direction.

MU 1 discharges at time t_1 and MU 2 discharges at time t_2 .

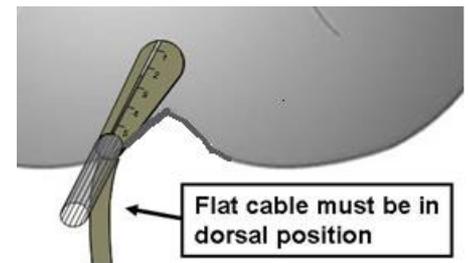
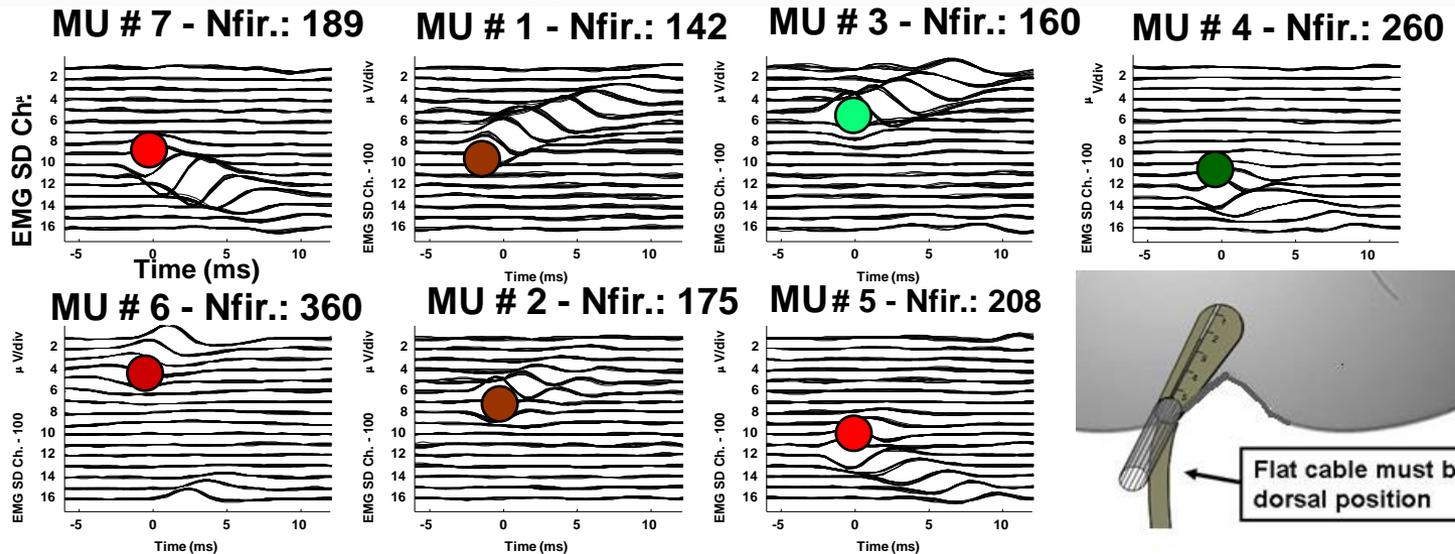
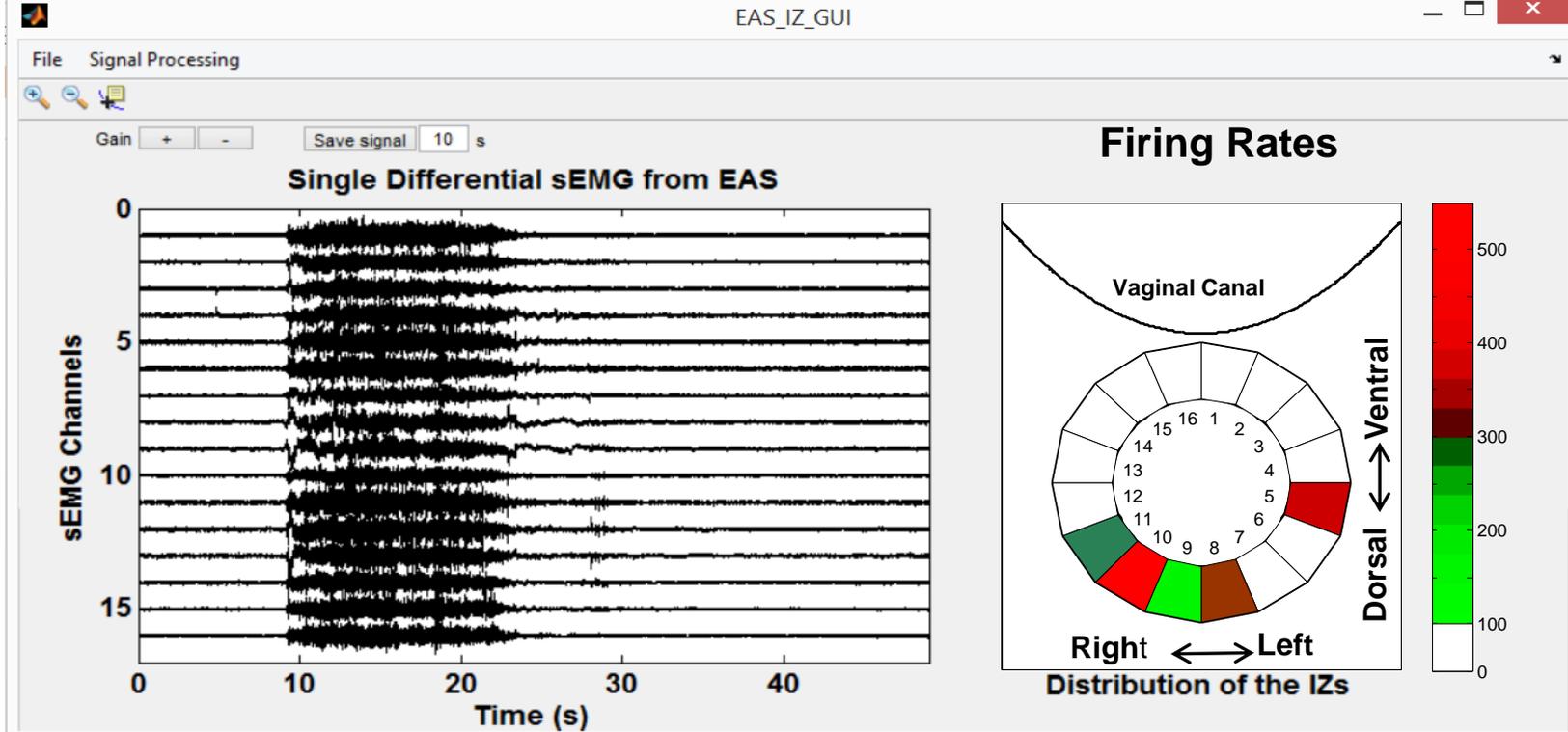




Possible sphincter damage due to episiotomy

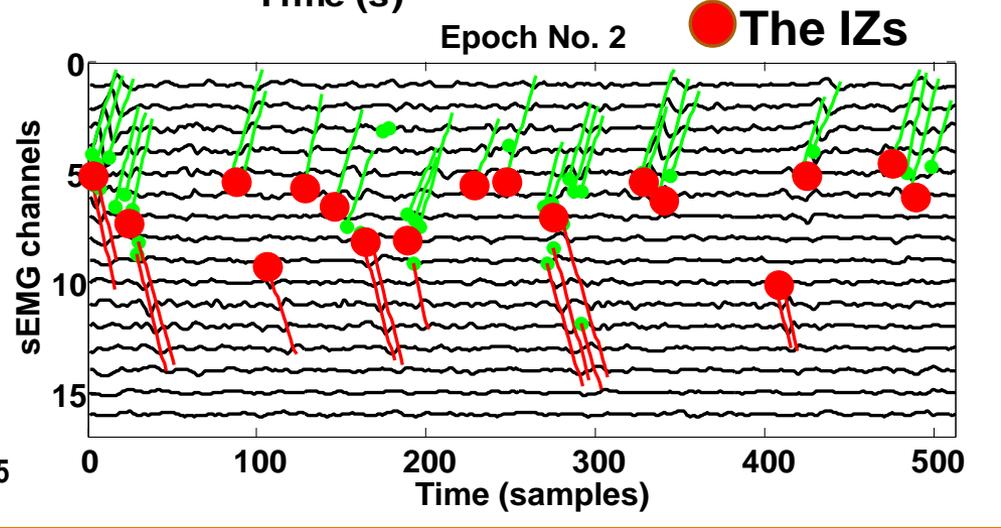
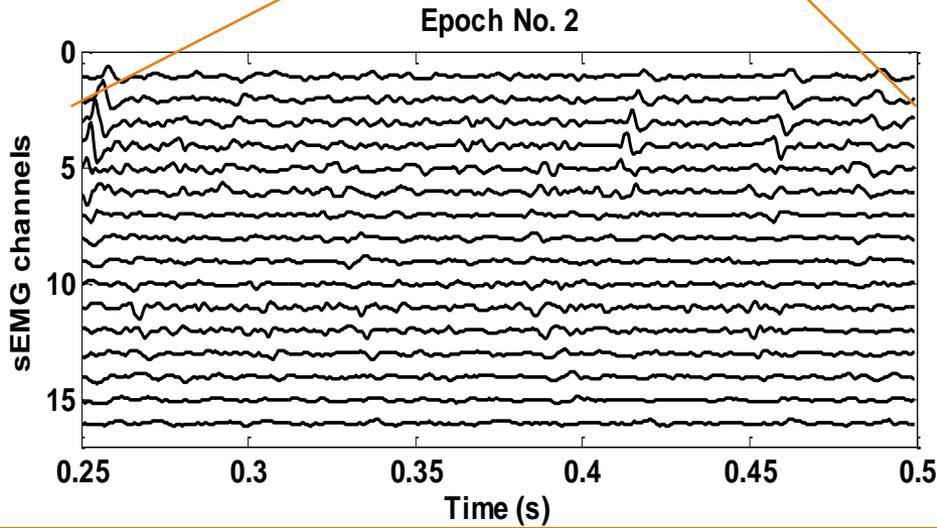
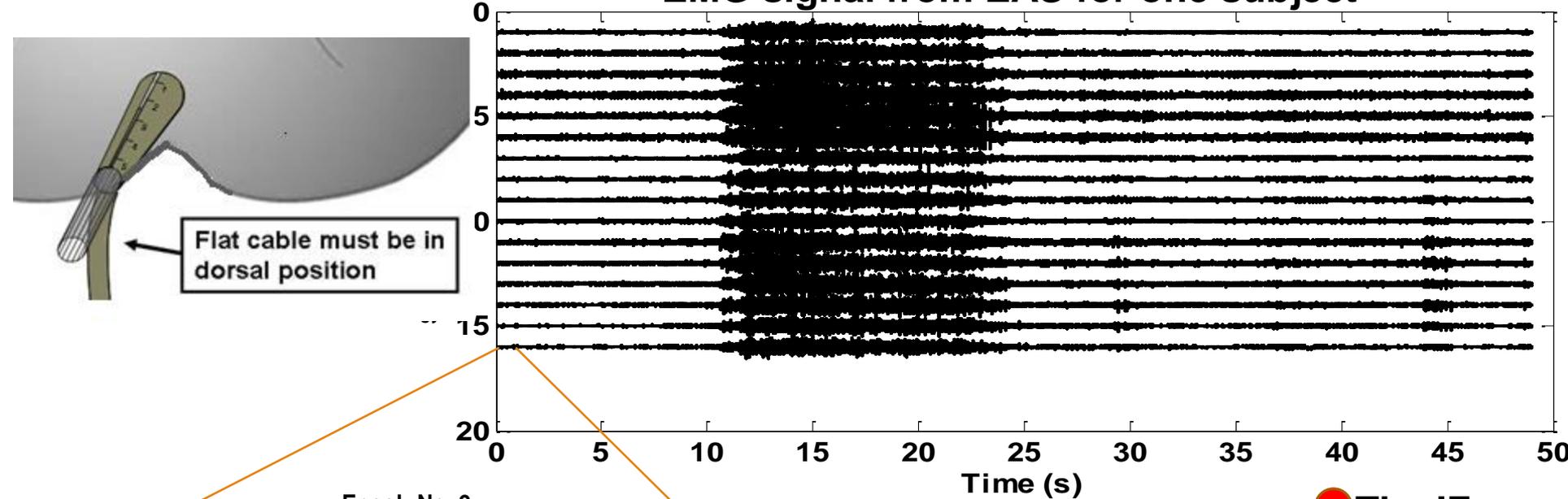


Detection of IZs after decomposition of the sEMG signal and display of the Firing rate



Muscle IZs Localization without prior decomposition of sEMG signal

EMG signal from EAS for one subject



The Graphical User Interface

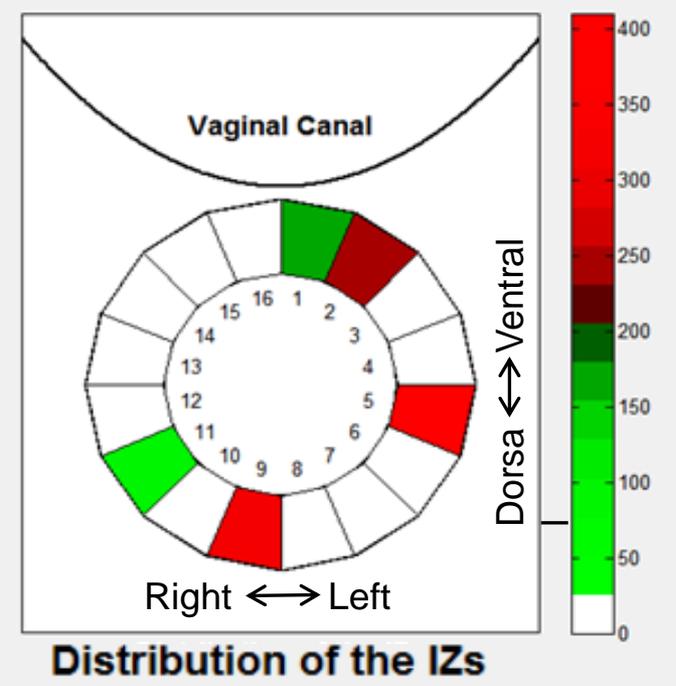
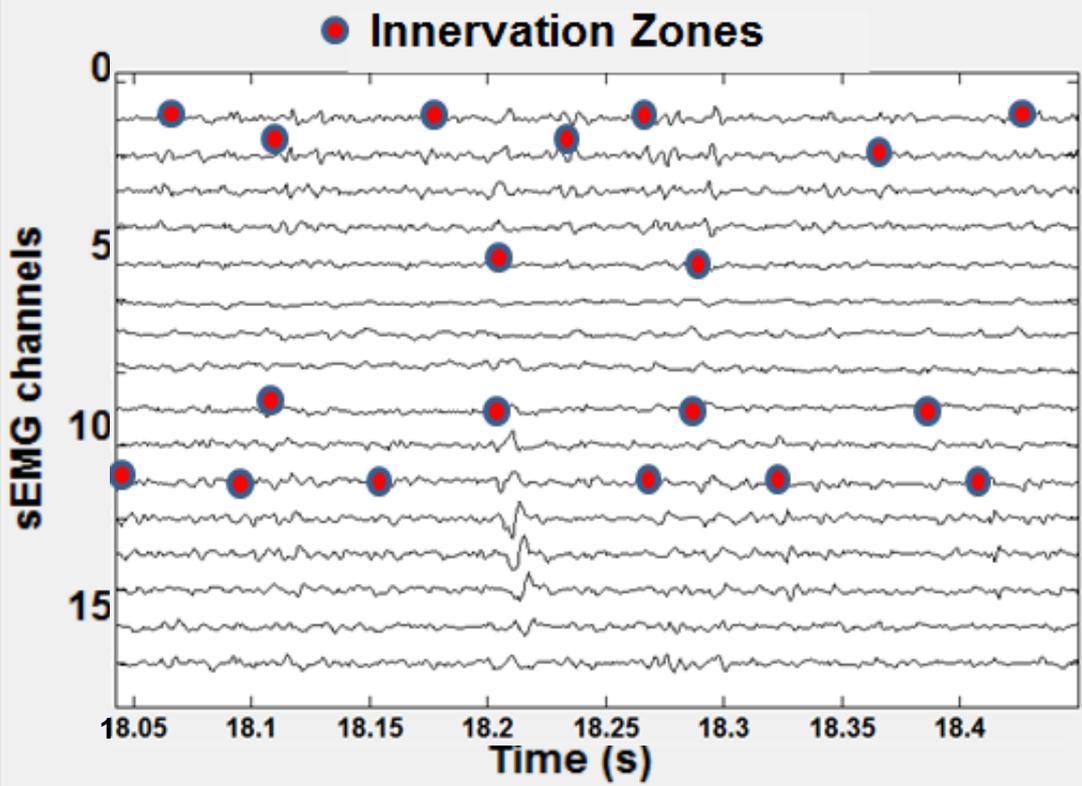
Figures - EAS_IZ_GUI

File Signal Processing Debug Desktop Window

Icons: Zoom in, Zoom out, Home, Hand, Grid, Split, Maximize, Close

EAS_IZ_GUI

Gain Save signal s



Summary table of child-delivery-related incontinence cost in Italy and possible savings

▪ Child deliveries per year (58% with episiotomy)	500.000
▪ Estimated cases of fecal incontinence (FI) due to obstetric trauma (3%)*	15.000
▪ Estimated cost of a FI patient per year (**) (1999 estimate)	2000€
▪ Total annual cost of FI due to obstetric trauma	30 M€
▪ Estimated cost of a test of EAS innervation pattern	20 €
▪ Cost of testing 500.000 cases per year at 20 € each	10 M€
▪ Savings on annual FI cost assuming a 50% prevention ability of the test	15 M€
▪ Estimated direct actual savings per year by adopting the screening in Italy	5 M€

Indirect costs (lost jobs, need for assistance, legal costs, quality of life) are not included.

* Dudding T, Vaizey C, Kamm M, Obstetric anal sphincter injury: incidence, risk factors, and management. Ann Surg. 2008 Feb;247(2):224-37.

** Mellgren A, Jensen LL, Zetterstrom JP, et al: Long-term cost of fecal incontinence secondary to obstetric injuries. Dis. Colon Rectum , 1999. 42, 857–865

Thank you all!