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Corrigendum

Erratum to "On spurious and real fluctuations of dynamic functional connectivity during rest"

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The authors would like to correct an error in the derivation of the formula for sliding-window covariance of pure sinusoidal signals that are phase-locked (i.e., when fluctuations are spurious). While the derivation of the second term of Eq. (2) correctly uses the product-to-sum trigonometric identity, there is a missing factor of 2 in the similar derivation of the *first* term of Eq. (2); i.e., after correction it should read:

$$\begin{aligned}\frac{\mathrm{TR}}{w}\sum_{i=n-\Delta}^{n+\Delta} x_i y_i &= \frac{\mathrm{TR}}{w}\sum_{i=n-\Delta}^{n+\Delta}(\cos(\theta)+\cos(4\pi f i\mathrm{TR}+\theta))\\ &= \cos(\theta)+\frac{1}{w}\int_{n-\Delta-1/2\mathrm{TR}}^{n+\Delta+1/2\mathrm{TR}}\cos(4\pi f t+\theta)dt\\ &= \cos(\theta)+\frac{1}{2w\pi f}\cos(4\pi f n\mathrm{TR}+\theta)\sin(2\pi f 2\Delta+1\mathrm{TR}),\end{aligned}$$

where we have used $w=(2\Delta+1)\mathrm{TR}$, and, in addition, we improved the approximation of the sum by integration by slightly changing the bounds as to integrate over the full length of the window. The expression of Eq. (5) for sliding-window covariance then reads:

$$\begin{aligned}c_{xy}[n] = \cos(\theta)&+\frac{1}{2w\pi f}\cos(4\pi f n\mathrm{TR}+\theta)\sin(2\pi f(2\Delta+1)\mathrm{TR})\\ &-\frac{2}{w^2\pi^2 f^2}\cos(2\pi f n\mathrm{TR})\cos(2\pi f n\mathrm{TR}+\theta)\sin^2(\pi f(2\Delta+1)\mathrm{TR}).\end{aligned}$$

These corrections only change the behavior of sliding-window covariance and sliding-window correlation between phase-locked sinusoidal components where the wavelength is larger than the window length. However, the first crossing of the sliding-window covariance (as function of window length) with the true covariance remains unaltered. Therefore, the conclusions and the proposed rule-of-thumb for estimating dynamic functional connectivity do not change. For completeness, we have included the updated Figs. 1 and 2. The other sections of the paper are not affected by this correction. The updated software has been put online at http://miplab.epfl.ch/software/.

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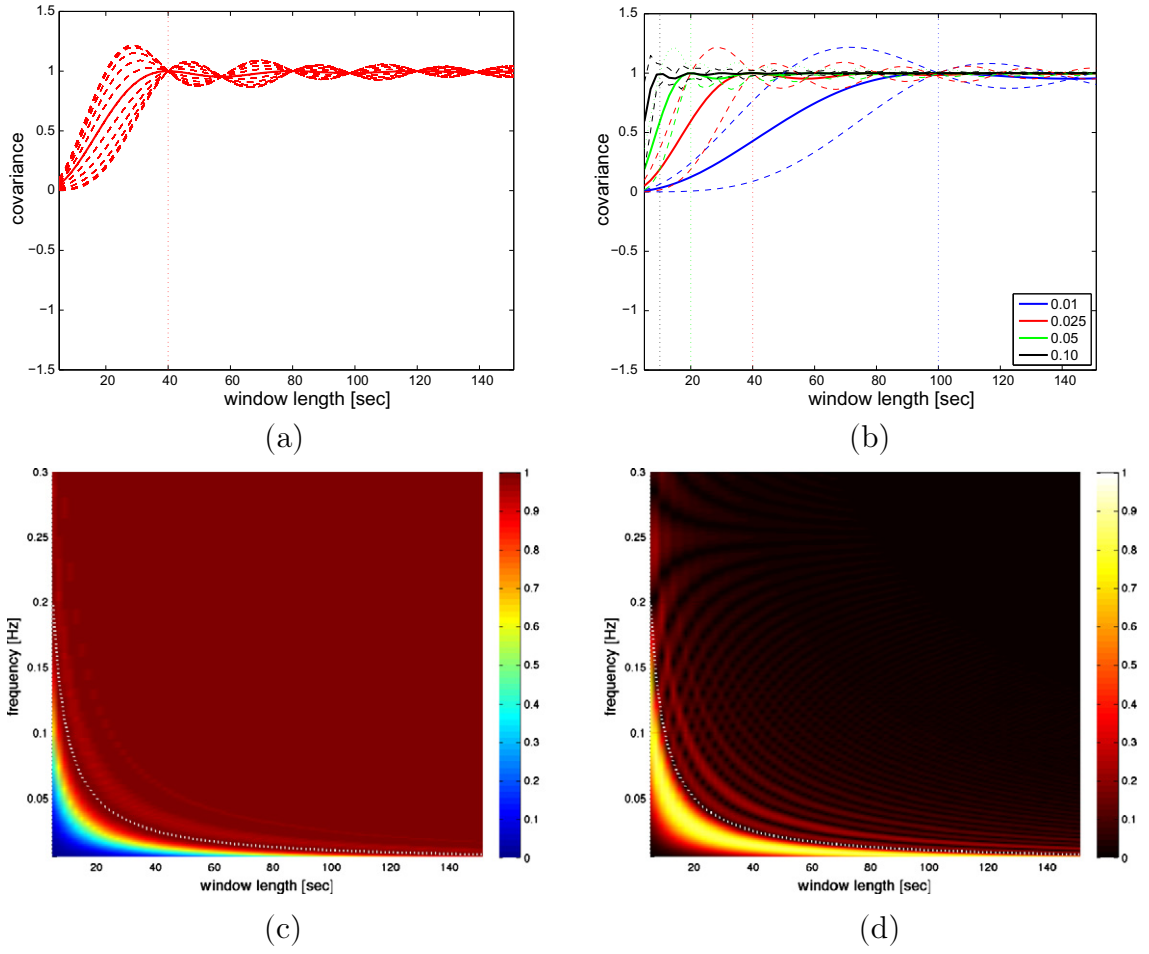

Fig. 1. Update of Fig. 1.

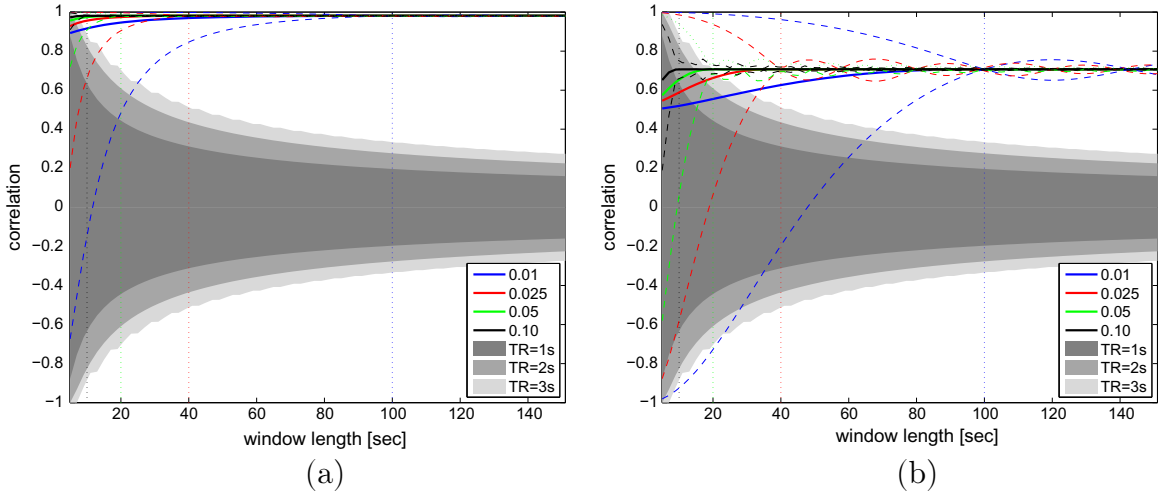

Fig. 2. Update of Fig. 2.