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## **Structure-dynamics relations for networks of spiking neurons - a multifractal approach**

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The study of the relations between structure and dynamics in neural networks has gained much momentum in the last years. Studies of this type often focus on specific network models to derive relations between structural statistics of the underlying adjacency matrix, as degree distribution, degree correlations or spectral radius, and activity statistic, as for example firing rate, synchrony, count correlations, (Riecke et al., Chaos 2007, Gaitieri and Rubin, Frontiers Comput Neurosci (2011), Pernice et al., under review). However, results of this type can be biased by strong correlations between different statistical features of the network model under consideration. The multifractal network generator (Palla, Lovasz and Vicsek, PNAS 2010) offers the possibility of generating network models with much higher variability and can therefore be used to systematically test this type of results in a more general context.

We present results based on an extensive set of simulations of networks of integrate-and-fire neurons. Biophysical parameters and overall connectivity were set to induce an asynchronous irregular state in a random network (Brunel, J Comput Neurosci, 2000).

On the one hand, our results indicate that different connectivity characteristics can induce a large variety of activity regimes. On the other hand, significant relations between structural properties and overall activity statistics might uncover important structural properties not yet investigated in anatomical studies.

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