

Poster presentation

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## Spike-timing prediction in a neuron model with active dendrites

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A complete model for single neurons must reproduce correctly the firing of spikes and bursts. Yet it must remain simple enough to be tractable in large-scale simulations. We present a study of a simplified model of Layer V pyramidal cells of the cortex with active dendrites. We hypothesized that we can model the soma and its apical trunk with only two compartments without significant loss in the accuracy of spike-timing predictions. The model is based on experimentally measurable impulse-response functions [1], which transfer the effect current injected in one compartment to the other. Each compartment was modeled with a pair of non-linear differential equations [2] with a small number of parameters that approximate the Hodgkin-and-Huxley equations. The predictive power of this model was tested on electrophysiological experiments where noisy current was injected in both the soma and the apical dendrite simultaneously [3].

### References

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