

# Computational statistics for neuronal mathematical models

*Adeline Samson.*

Université Grenoble Alpes.

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## **Abstract**

We will present some neuronal mathematical models and the associated challenges in terms of statistical inference. These models are hypoelliptic stochastic differential equations which are partially observed at discrete times. Exact likelihoods are not available in that case. We will present statistical methods based on pseudo-likelihood with a stochastic EM algorithm coupled to particle filter. We will also discuss the problem of approximating solutions of the diffusion by adapted numerical schemes such as splitting methods.