

# A minimal reaction-diffusion neural model generates *C. elegans* undulation

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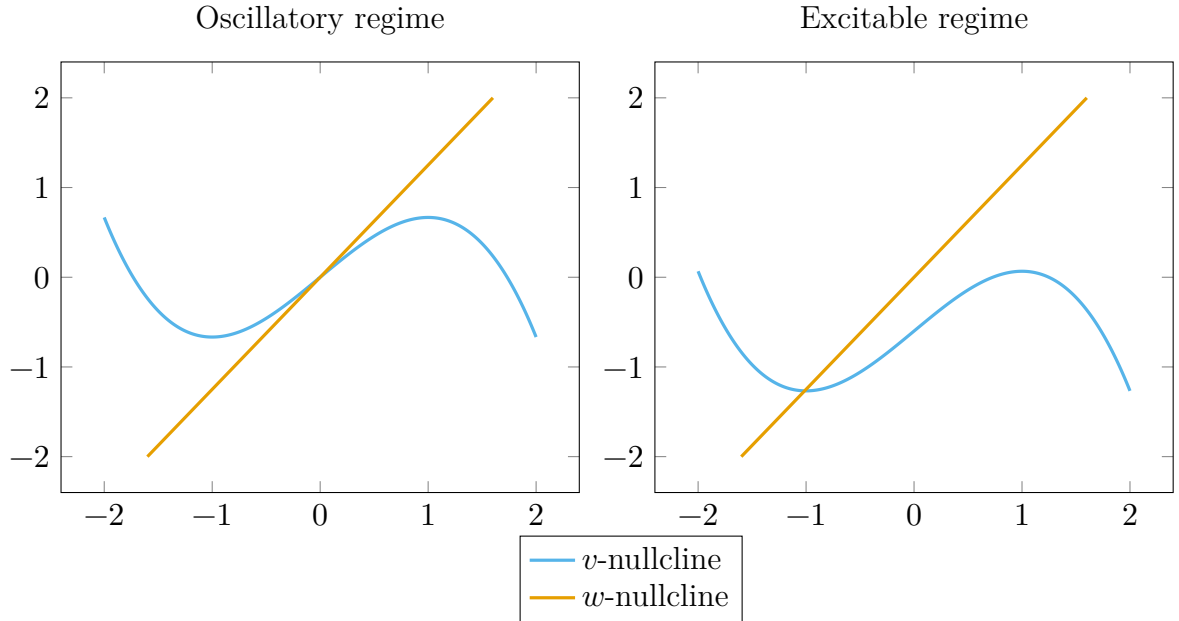
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## Abstract

The small (1 mm) nematode *Caenorhabditis elegans* has become widely used as a model organism; in particular the *C. elegans* connectome has been completely mapped, and *C. elegans* locomotion has been widely studied (c.f. <http://www.wormbook.org>). We describe a minimal reaction-diffusion model for the *C. elegans* central pattern generator (CPG) (c.f. Xu et al. 2018, Wen et al. 2012). We use simulation methods to show that a small network of FitzHugh (1961)-Nagumo (et al. 1962) neurons (one of the simplest neuronal models) can generate key features of *C. elegans* undulation (c.f. Magnés et al. 2017) and thus locomotion. Compare the neuromechanical model of Izquierdo and Beer (2015). We also investigate dynamics and stability of the model.

## I. INTRODUCTION

hello world



## II. CORRESPONDENCE

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