

Abstract Submitted  
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**Deciphering Neurofilament Motility in live cells<sup>1</sup>** CHRISTOPHER JOHNSON, PETER JUNG, Ohio University, Athens, OH — Neurofilaments are the most abundant cytoskeletal elements of mature neuronal axons. They are assembled in the axon and responsible for regulating the axon's diameter. These filaments are transported in a characteristic stop-and-go fashion along microtubule tracks toward the nerve terminal driven by the motor proteins, kinesin and dynein. To explore the mechanisms underlying the observed stop-and-go transport, we devise a computational model in which kinesin and dynein—coupled by respective force generation (tug-of-war)—are attached to the neurofilament cargo. The resulting movement and kinetic characteristics are compared with highly time-resolved kymograph recordings. This comparison determines whether the observed kinetics are consistent with a tug-of-war model, and also renders an estimate of how many motors are attached to the cargo during transport.

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