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## Biological filament interacting with molecular motors

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**Abstract content** <br> &nbsp; (Max 300 words)<br><a href="http://events.saip.org.za/getFile.py/target="\_blank">Formatting &<br>Special chars</a>

There has been a lot of work recently describing active matter in the context of biological systems. One such system is the propulsion of a biological filament by molecular motors. The motion is induced by chemical reactions with the motor proteins as well as noise. A simplified model describing these interactions is a variation of Brownian motion where the motor position along the filament is determined by a Langevin equation. We want to study the response of the filament on being brought into contact with the molecular motors as well as the fluctuations around this response. We have developed a formalism to deal with the time-dependent statistics of the motor attachment and detachment from the filament using the innovative technique of representing the detached state via a reservoir of motors at a certain temporal point. This allows us to formulate the motions of the attachment of the motors within a single distribution function, that can be treated easily computationally and also in certain analytic approximations. The results are also tested by computer simulations.

**Apply to be**<br> **considered for a student** <br> &nbsp; **award (Yes / No)?**

Yes

**Level for award**<br>&nbsp;(Hons, MSc, <br> &nbsp; PhD, N/A)?

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**Main supervisor (name and email)**<br>**and his / her institution**

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