

Abstract Submitted  
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**Collective alignment of polar filaments by molecular motors<sup>1</sup>**

FALKO ZIEBERT, IGOR ARANSON, Argonne National Laboratory — We study the alignment of polar biofilaments, such as microtubules and actin, subject to the action of multiple molecular motors attached simultaneously to more than one filament. Focusing on a paradigm micromechanical model of only two filaments interacting with multiple motors, we were able to investigate in detail the dynamics of the filaments' alignment. While almost no alignment occurs in the case of a single motor, we show that the filaments become perfectly aligned due to the collective action of the motors working together. Our studies revealed that the alignment time is governed by the magnitude of the fluctuations in the motor force.

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