

Abstract Submitted
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Sticks in honey - Motor-connected Microtubules at low Reynolds number ROTEM S. BERMAN, Department of Physics, Technion -IIT, ALEX LESHANSKY, Department of Chemical Engineering, Technion -IIT, JOSEPH E. AVRON, Department of Physics, Technion -IIT — It is known that suspensions of microtubules (MTs) and molecular motors spontaneously form ordered asters and vortices. We consider the motion of MTs' assemblages connected by molecular motors at low Reynolds number. The MTs are modeled as rigid sticks and their hydrodynamic interaction with the medium is determined using slender body approximation. The motors are modeled as moving points which provide kinematic constraints for the sticks' motion. The hydrodynamic alignment of a pair of MTs for two possible motor connections is considered: a single head motor connection, in which the motor moves on one of the sticks and carries the other one, and a dual head motor connection whereas the motor advances on both sticks. We further address the formation of an aster from the vortex of inter-connected MTs. The forces the motors need to exert on the MTs in the course of closing the vortex and their dependence on the number of MTs are computed.

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