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Molecular motor driven transportation on microtubule loops AURELIEN SIKORA, FILIPPO FEDERICI, KYONGWAN KIM, WPI-AIMR, Tohoku University, Japan, HIKARU NAKAZAWA, Department of Biomedical Engineering. Tohoku University, Japan, MITSUO UMETSU, Department of Biomedical Engineering, Tohoku University, Japan, WONMUK HWANG, Materials Science and Engineering; Department of Biomedical Engineering, Texas A&M University, WINFRIED TEIZER, WPI-AIMR, Tohoku University, Japan; Department of Physics and Astronomy/Materials Science and Engineering, Texas A&M University
— Molecular motors such as kinesin are naturally fitted for the transport of cargo. By offering an unlimited path, microtubule loops allow the study of kinesin motility on distances exceeding that offered by a single microtubule. Moreover, the periodicity of the path allows the comparisons of trajectories between laps. Here we study the motility of quantum dot labeled kinesin on microtubule loops. Motility of kinesins over multiple laps is observed and their trajectories are extracted from kymograph using a custom algorithm. Distribution of velocities at given locations do not vary randomly but show a correlation with the presence of obstacles. Possible mechanisms responsible for the long range transport are discussed in the context of available theories.

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