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**“Shooting Bead” Method with Filament Energy Loss Consideration for Finding the Flexural Rigidity of the Rodlike Biological Filaments**

ABDORREZA SAMARBAKHS, JACK TUSZYNSKI<sup>1</sup>, Department of Physics, University of Alberta, Edmonton, Canada — Flexural rigidity is one of the important characteristics of flexible polymers including biological filaments. For elastic deformation it is analogous to the spring constant in the Hook’s law for bending. In this work we propose a new method for experimentally evaluating the cantilever stiffness and flexural rigidity of semiflexible rodlike biological filaments based on the measurement of just two distances. The method is based on applying a force normal to the filament with a microsphere bead trapped in the laser tweezer followed by its sudden release. Through two simple measurements of the initial and final position of the bead, the cantilever stiffness and flexural rigidity of the filament can be found from the formula that has been provided. In the second part, the effect of filament radius has been taken into account and a new formula with filament energy loss consideration, for flexural rigidity and the cantilever stiffness has been found.

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