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Role of the inter-protofilament sliding in the bending of protein microtubules

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Abstract This paper aims to identify the role of the inter-protofilament (*PF*) sliding in the bending of microtubules (MTs). A molecular structural model (MSM) was employed to study the dependence of bending on the inter-*PF* bonds. It was found that the inter-*PF* bonds serve as an angle spring that controls the inter-*PF* sliding during the bending. When the angle spring is soft inter-*PF* sliding occurs leading to the length-dependent bending stiffness of MTs. Such a size dependent bending stiffness may also affect the vibration and buckling behavior of MTs where bending deformation is predominant.

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