

Abstract Submitted
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Force Generated by Actin Array KONSTANTINOS TSEKOURAS, Institut Curie, DAVID LACOSTE, Ecole Supérieure de Physique et Chimie Industrielles, KIRONE MALLICK, CEA Saclay, JEAN-FRANCOIS JOANNY, Institut Curie — We study a theoretical model for a group of parallel filaments growing against a barrier held by a constant force. An array of N filaments nucleate on a fixed surface and grow towards a rigid barrier which is held in place by a constant force. Filaments are coupled only by mechanical contact against the barrier. We obtain the filament density distribution in terms of the distance from the barrier, and force-velocity curves. We apply our model to the case of an array of actin filaments. All results are validated by extensive Monte-Carlo simulations. For a small value of N we find the stall force to be N times the stall force of a single filament ($f_{stall} \approx N f_{stall}^1$). For large N we find that the velocity *appears* to be considerably smaller, an effect due to its exponential decrease as the theoretical stall force is approached.

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