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DK Seminar

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University of Vienna
Oskar-Morgenstern-Platz 1, HS 2.

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A Model for Non-sarcomeric Actomyosin Bundles with Variable Filament Lengths

Acto-Myosin bundles are macroscopic structures within a cell that are used for various processes such as transport of nutrients and mechanical stability of the cell. Dietmar Iz developed a model relating the flows of F-Actin to the effects of cross-linkers and bundling proteins, the forces generated by myosin-II filaments as well as external forces at the tips of the bundle. In previous works we concentrated on the asymptotic regime where actin filaments are assumed to be short compared to the length of the bundle.

We are considering the full problem now, consisting of integral equations describing the forces acting on a single filament, taking into account variable filament lengths. In this talk I will present some of the challenges for the analysis of the full problem, some simplifications we made, as well as strategies for proving existence and uniqueness of solutions.