

Abstract Submitted
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Optimal control of growing sheets GARETH JONES, L. MAHADEVAN, Harvard University — There has been much recent interest in plates and sheets that have the ability to actively swell, grow and bend. In this presentation an inhomogeneously growing plate is modeled by prescribing the in-plane growth strain and the active change-of-curvature function. The plate will then change shape to accommodate the induced strains. For applications of this phenomenon, an important problem is how best to choose these functions in order for the plate to deform to a given target shape. In seeking an answer to this question, we have developed a computational approach, where the growth strains will be found as solutions to a numerical optimization procedure. Example results will be presented which will provide some insight into the mechanical behavior of growing thin structures.

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