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Rapid Solidification of Polymeric Fibers **193**
We are developing macroscopic and molecular models for the rapid directional solidification of polymeric fibers.

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On-Line Measurement of Fabric Properties 53
We are developing a system to measure yam and fabric tension and fabric bending properties on-line.

Dye Diffusion **in Polyamide and Polyester Fibers** **255**
We are seeking ways to eliminate dye streaks based on understanding the mechanisms which limit the thermal mobility of polymer molecule segments in fibers.

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Information Integration in the Textile Complex 295
We are designing integrated information management systems for textile manufacturing operations for responsive dynamic networking of organizations. [196-S 15]

Lifestyle Aspiration as a Purchasing Motivation 73
We are developing predictive models of future purchases based on consumers' current images of aspirational lifestyles.

Fiber Microstructure and Fatigue

S.K. Batra and Hawthorne Davis

Objective

<u>Details</u>

A survey of commercial PET tire cord fibers found that they generally had orientation which increased substantially, from low in the center to higher at the surface. This was not surprising, since most tire yarns today are made with technology similar to that used to make feed yarns for draw texturing. Surprising, however, was the fact that in general the fibers had a structure which deviated significantly from the radially symmetrical assumption necessary to solve the optical equations for obtaining accurate refractive index profiles. Figure 1 shows a plot of 20 optical path difference scans across a single commercial tire cord fiber. These were taken at consecutive points, 1 mm apart along the fiber, which had a diameter of about 18 ηαμ. Iφηεφιβερ. ερε

Appendix
Measuring the Refractive Index Profile of Non-radially Symmetrical and/or Non-round Textile Fibers

Weiqun Zou

1. Introduction

In a transparent nonpolar dielectric medium, the speed of light depends primarily on the density where $u=rn(r)$, $u_R=n_R R$ and

dimensional Radon Transform of f(r, ϕ). The limits $\pm\infty$ can be used for convenience since it is assumed that the phase object decays smoothly to zero at the edges of the field.

How to invert the N(, θ

iv. using computational ray tracing, calculate the path length transform of the estimated field:

$$(\quad , \quad) = P\,[\,n\ (r, \quad);\, n_0\,]$$