

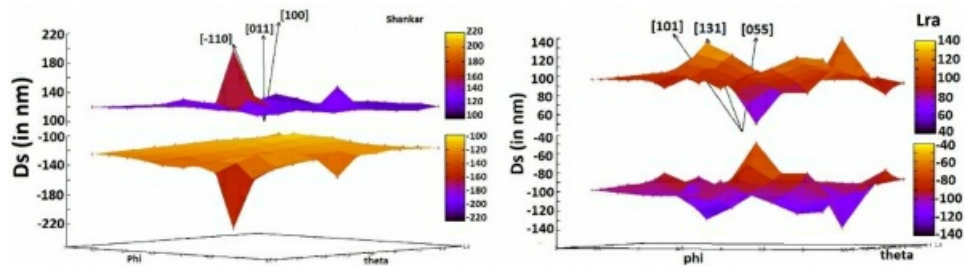
*Imaging of crystalline regions in cotton fibers using powder XRD*

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X-ray imaging of crystalline region in cotton fibers were computed which depicts the ordered crystalline regions and Functional Data Analysis has been used to find the correlation between various parameters. Four different varieties of cotton fibers grown in Karnataka state, India were investigated. X-ray powder diffraction data of these fibers were analyzed with in-house software. X-ray data were corrected for instrumental broadening and Lorentz polarization factors before using it for further analysis. Using Peakfit® program, 20 Bragg reflections were identified and cell parameters were determined by CHECKCELL®, and FWHM of these reflections were used to estimate the crystallite size and strain along [hkl] directions. Using these results and a novel method was employed to compute the ordered 3-dimentional region of the crystallite shapes in these cotton fibers. This technique can be extended to any materials. Correlation between varieties of fibers and each physical parameter like crystallite size, strain, tenacity and staple length have been given employing functional data analysis [1].

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