



Library Indian Institute of Science Education and Research Mohali



DSpace@IISERMohali (/jspui/)
/ Publications of IISER Mohali (/jspui/handle/123456789/4)
/ Research Articles (/jspui/handle/123456789/9)

Please use this identifier to cite or link to this item: <http://hdl.handle.net/123456789/2769>

Title:	Optically probing torsional superelasticity in spider silks
Authors:	Kumar, Bhupesh (/jspui/browse?type=author&value=Kumar%2C+Bhupesh) Thakur, Ashish (/jspui/browse?type=author&value=Thakur%2C+Ashish) Panda, Biswajit (/jspui/browse?type=author&value=Panda%2C+Biswajit) Singh, K.P. (/jspui/browse?type=author&value=Singh%2C+K.P.)
Keywords:	Optical technique Sensitive Investigate torsion Mechanics
Issue Date:	2013
Publisher:	American Institute of Physics
Citation:	Applied Physics Letters, 103(20).
Abstract:	We investigate torsion mechanics of various spider silks using a sensitive optical technique. We find that spider silks are torsionally superelastic in that they can reversibly withstand great torsion strains of over 102–3 rotations per cm before failure. Among various silks from a spider, we find the failure twist-strain is greatest in the sticky capture silk followed by dragline and egg-case silk. Our in situ laser-diffraction measurements reveal that torsional strains on the silks induce a nano-scale transverse compression in its diameter that is linear and reversible. These unique torsional properties of the silks could find applications in silk-based materials and devices.
URI:	https://aip.scitation.org/doi/full/10.1063/1.4831766 (https://aip.scitation.org/doi/full/10.1063/1.4831766) http://hdl.handle.net/123456789/2769 (http://hdl.handle.net/123456789/2769)
Appears in Collections:	Research Articles (/jspui/handle/123456789/9)

Files in This Item:

File	Description	Size	Format
Need to add pdf.odt (/jspui/bitstream/123456789/2769/1/Need%20to%20add%20pdf.odt)		8.63 kB	OpenDocument Text

[View/Open \(/jspui/bitstream/123456789/2769/1/Need%20to%20add%20pdf.odt\)](#)

[Show full item record \(/jspui/handle/123456789/2769?mode=full\)](#)

[Statistics \(/jspui/handle/123456789/2769/statistics\)](#)

Items in DSpace are protected by copyright, with all rights reserved, unless otherwise indicated.

