Electronic Supplementary Material (ESI) for Nanoscale Advances.

Supporting Information

Graphene fibre film/polydimethylsiloxane nanocomposites for high-performance electromagnetic interference shielding

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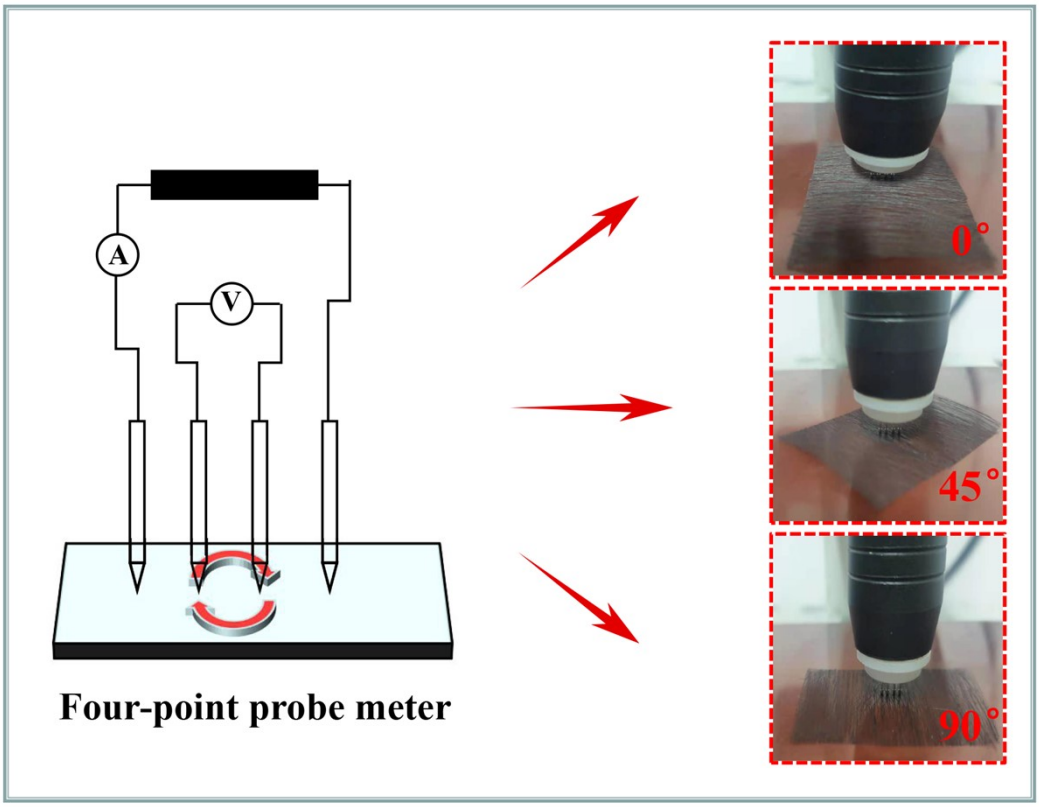

Fig. S1 Testing process of electrical resistivity (σ^{-1}) of GFF. The electrical resistivity of the GFF at 0°, 45°, and 90° was measured by rotating the membrane to change the angle between the axial direction of the fiber and the four probes.

Table S1 Electrical conductivity (σ) data of GFF

Surface density ($kg \cdot m^{-2}$)	Angle (°)	Electrical conductivity (S/m)	Standard deviation
5	0	5.55	0.36
	45	1.55	0.10
	90	0.94	0.94
10	0	14.43	2.38
	45	3.90	0.35
	90	2.72	0.29
20	0	36.33	4.99
	45	8.08	0.53
	90	4.94	0.51

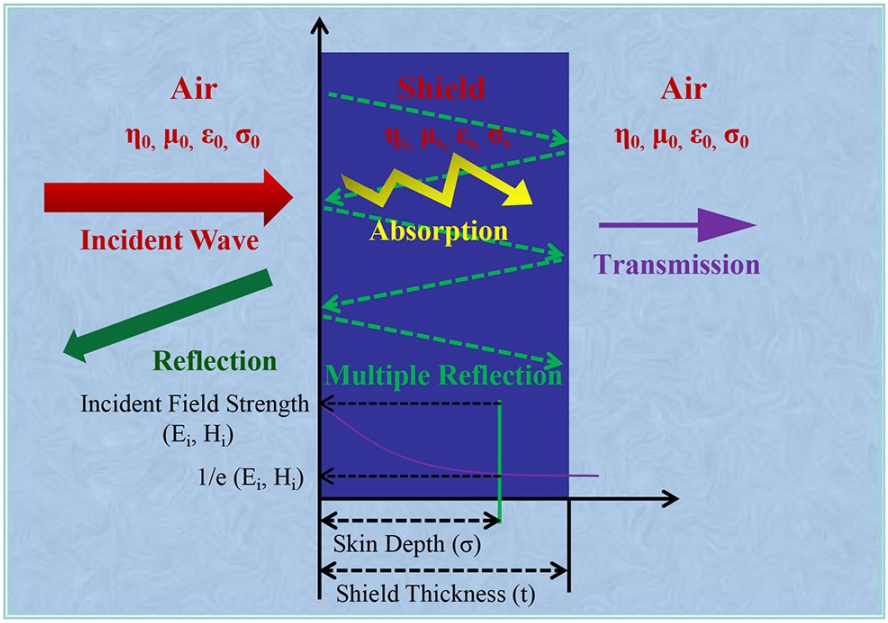

Fig. S2 Schematic representation of **(a)** EMI shielding mechanisms and **(b)** a quarter wavelength matching layer.

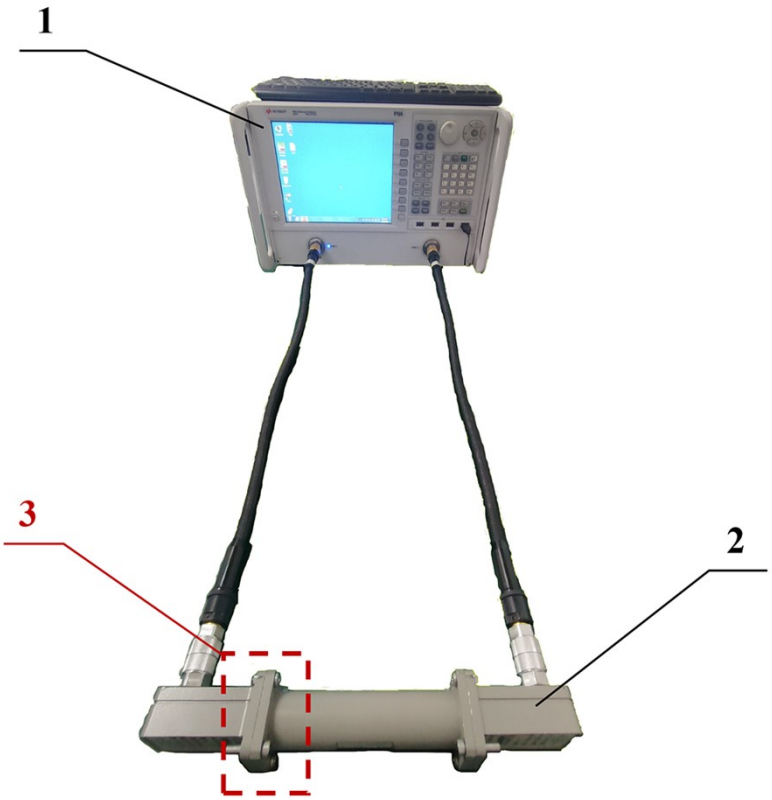

Fig. S3 Electromagnetic interference shielding test instrument (1-Vector network analyzer (VNA); 2-Rectangular waveguide; 3-Test sample loading position).

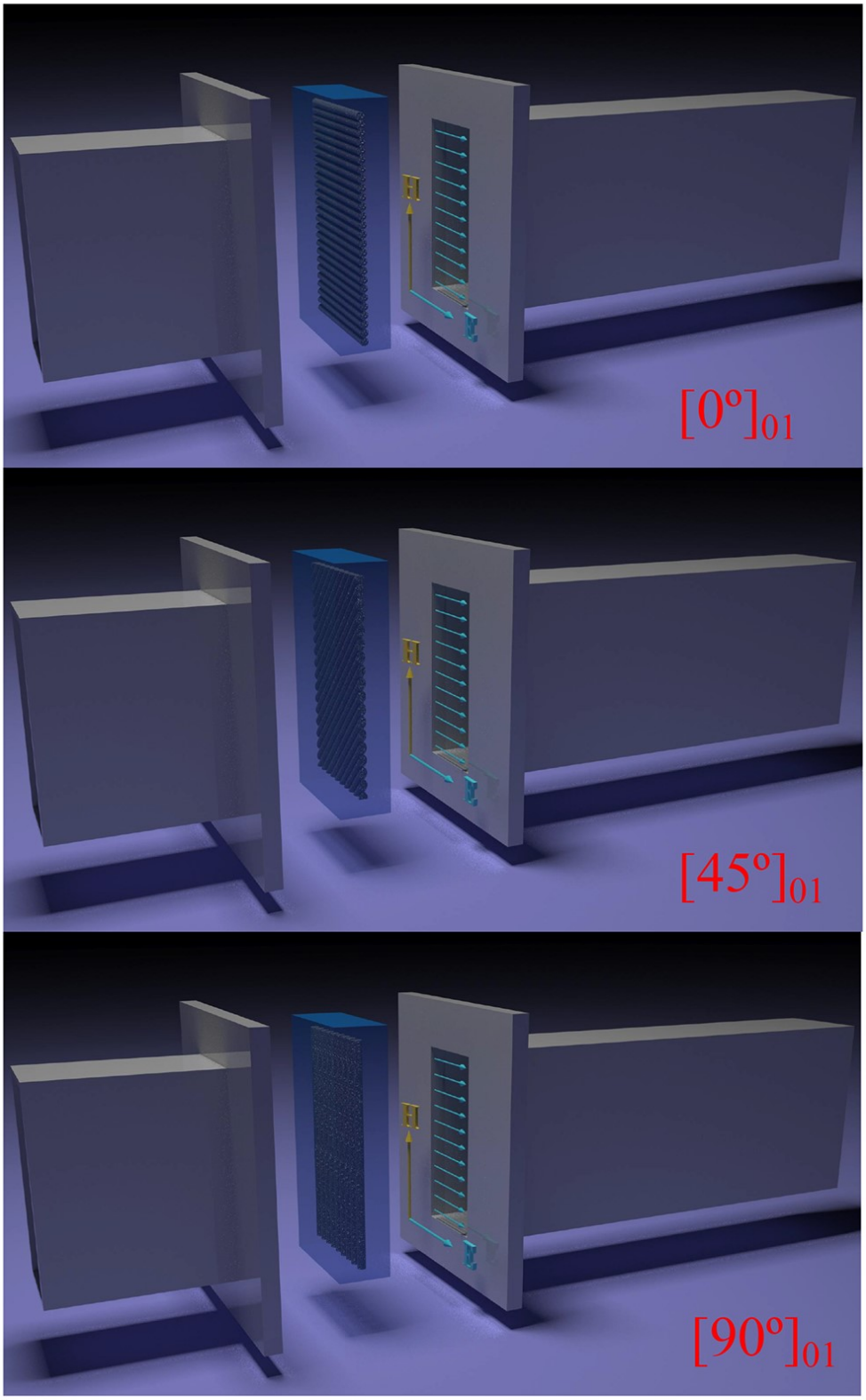

Fig. S4 Schematic of using rectangular wave-guides to test the EMI shielding properties of GFF/PDMS composites with one-ply unidirectional configuration.

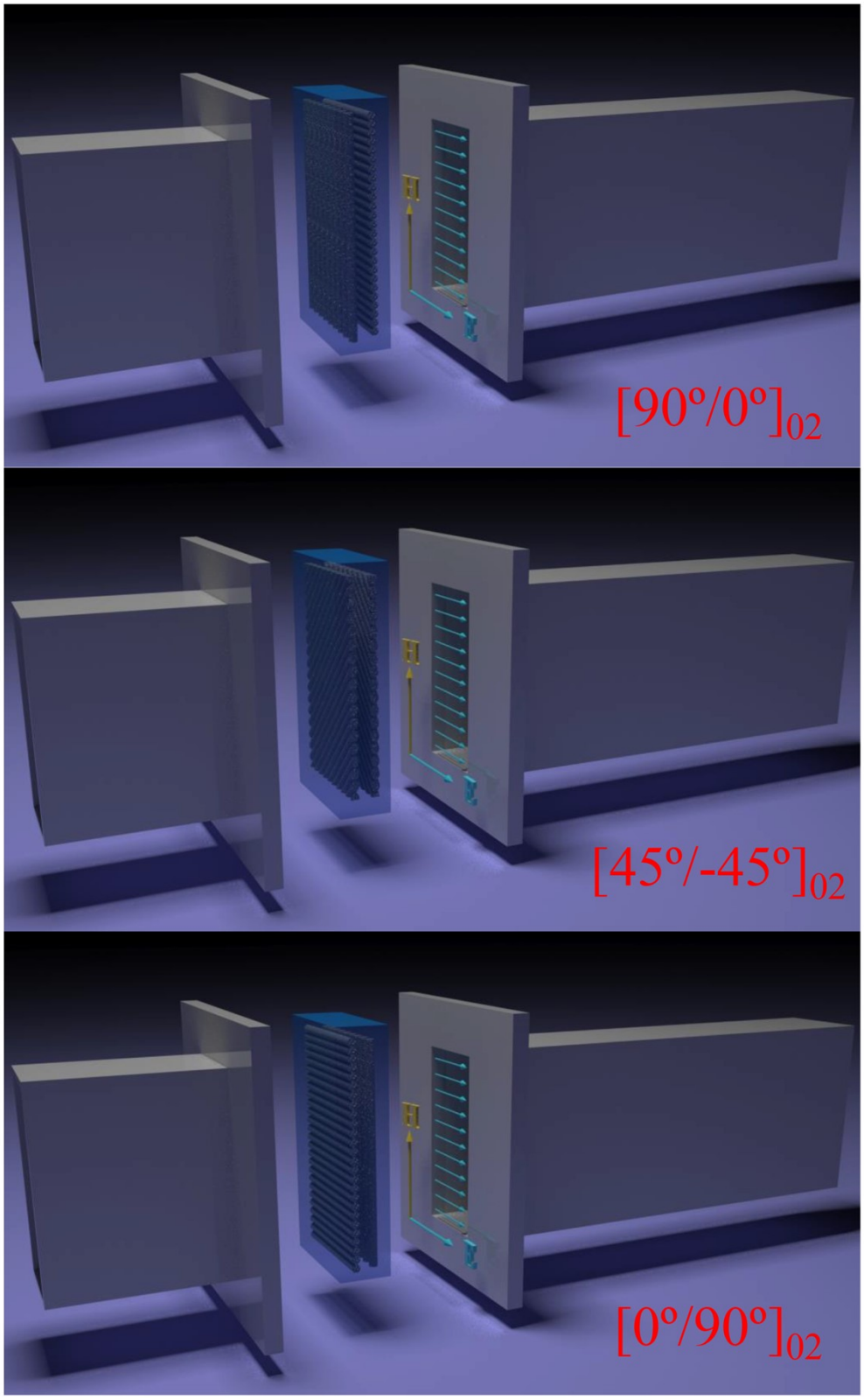

Fig. S5 Schematic of using rectangular wave-guides to test the EMI shielding properties of GFF/PDMS composites with two-ply cross-ply configuration.

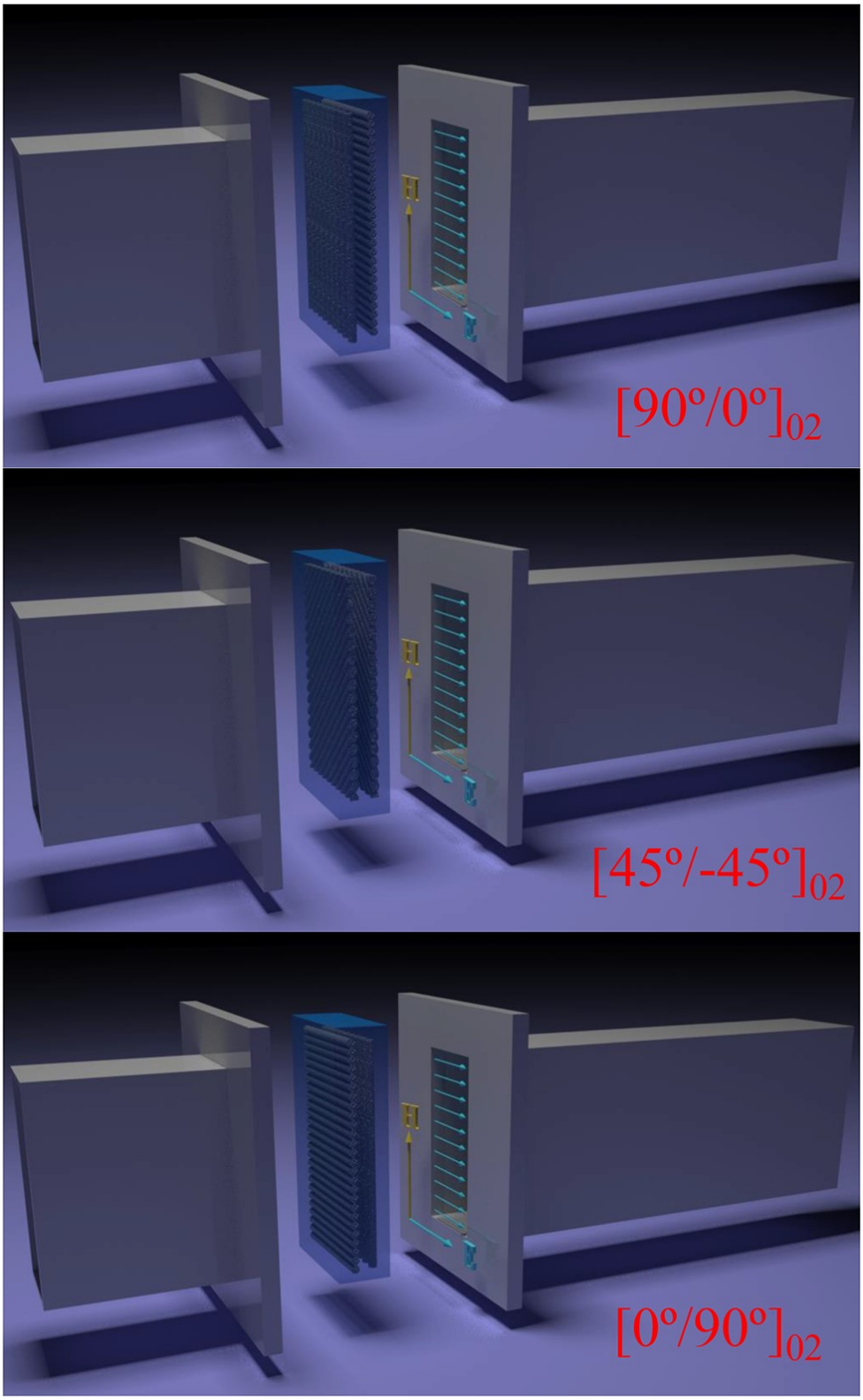

Fig. S6 Schematic of using rectangular wave-guides to test the EMI shielding properties of GFF/PDMS composites with two-ply unidirectional configuration.

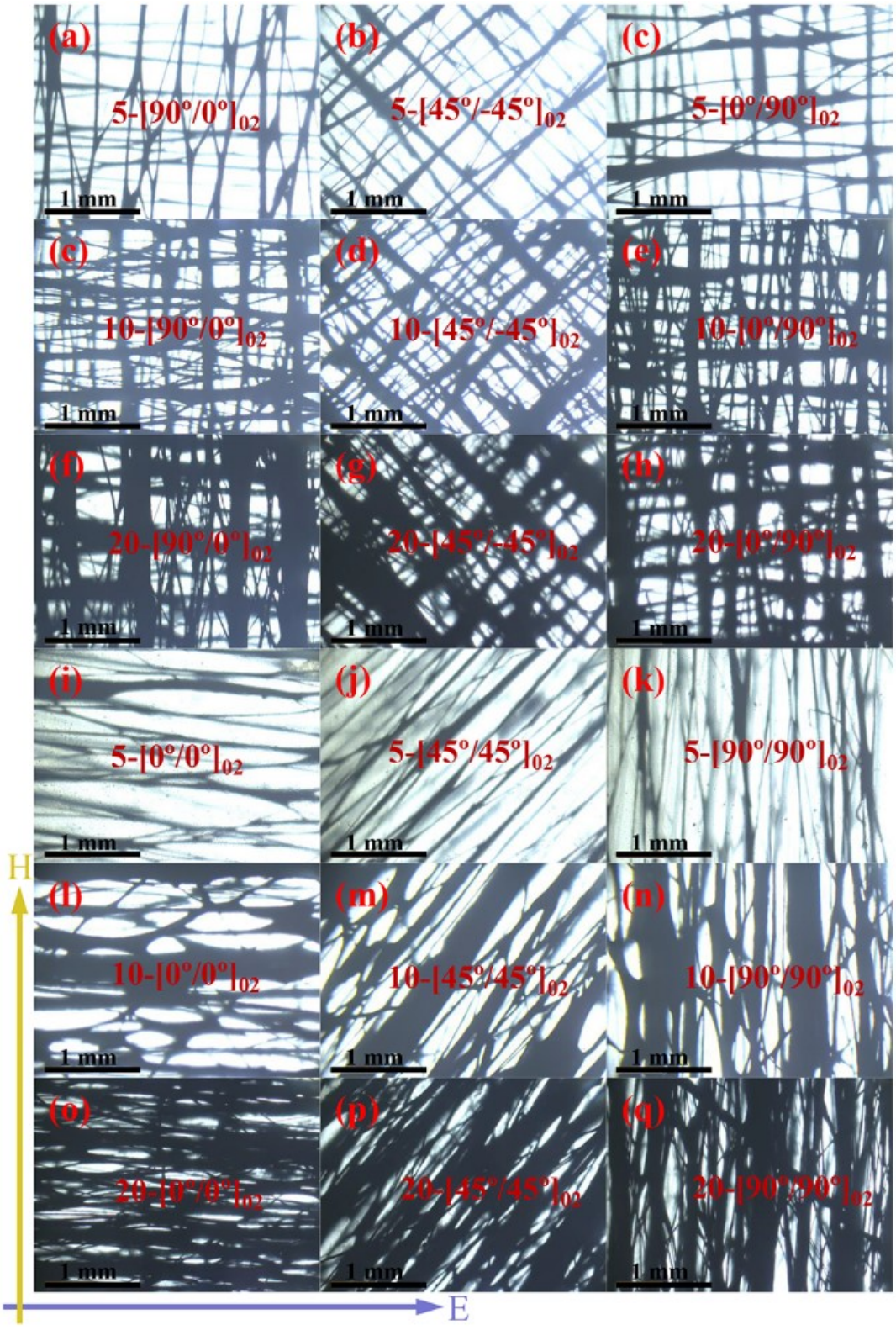

Fig. S7 Polarizing microscope images of two-ply GFF/PDMS nanocomposites with various configuration and areal density GFF.

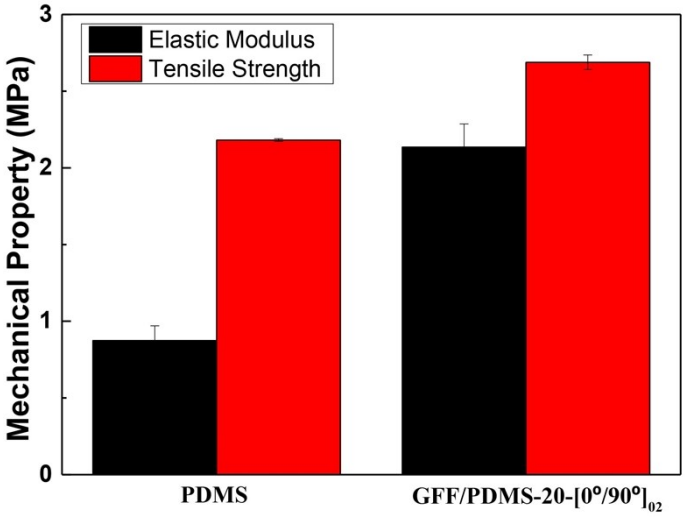

Fig. S8 Comparison of mechanical properties between pure PDMS film and GFF/PDMS composite film(20-[0^{o} /90^{o}]$_{02}$).