Supporting Information

Microstructural deformation observed by Mueller Polarimetry during traction assay on myocardium samples

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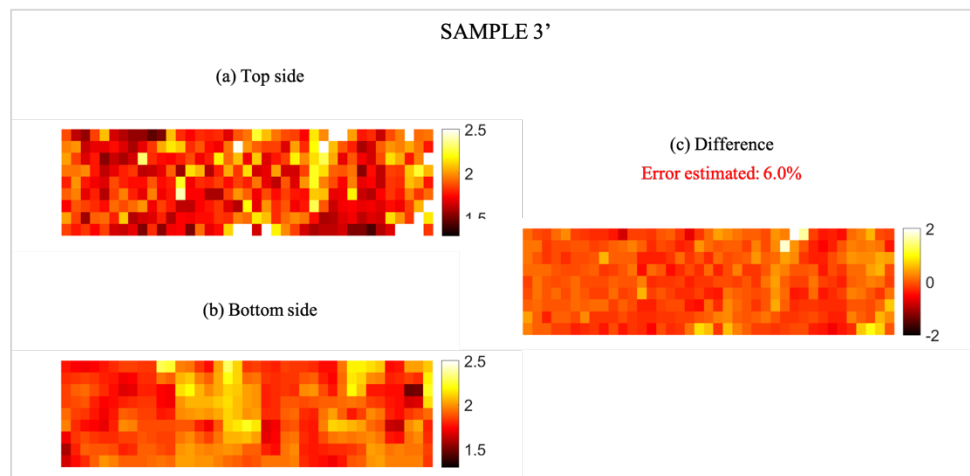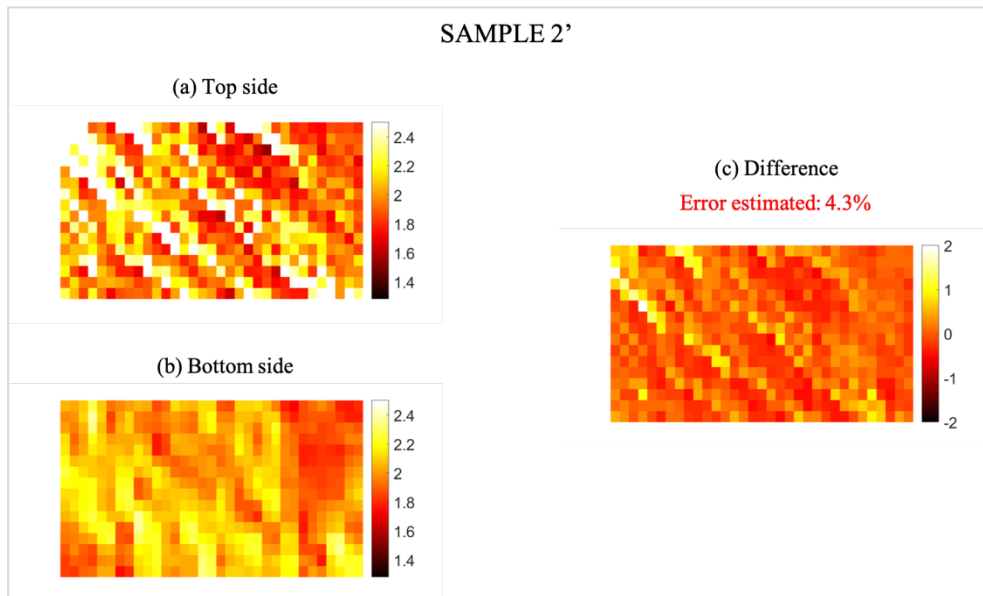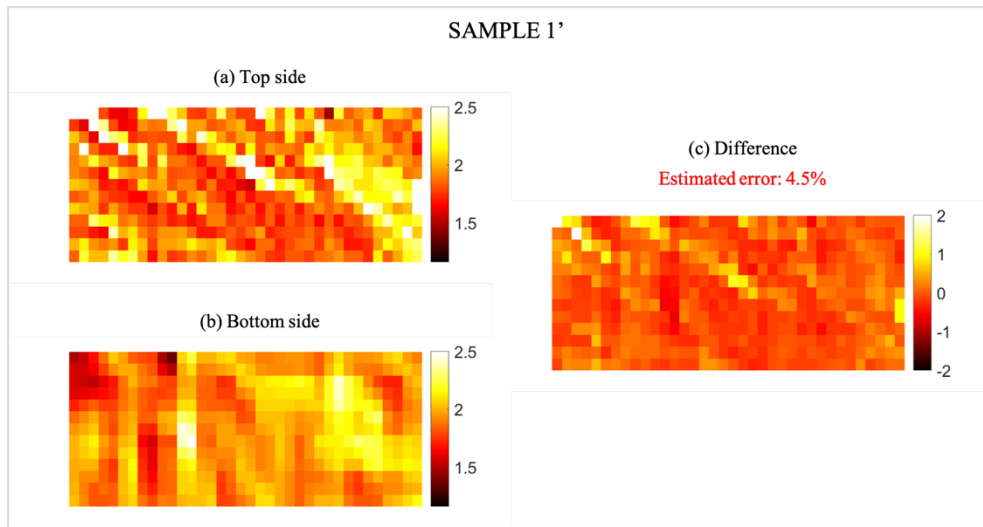
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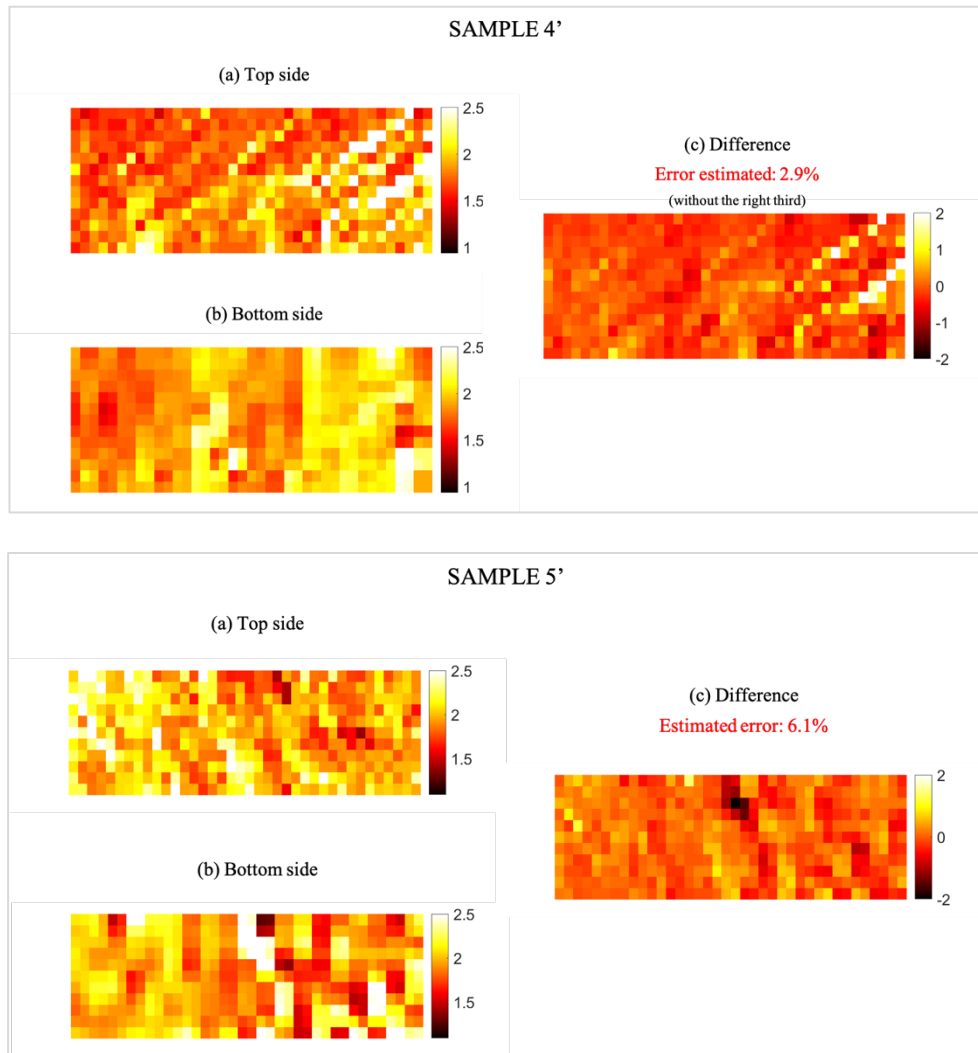
Supplementary figure 1:

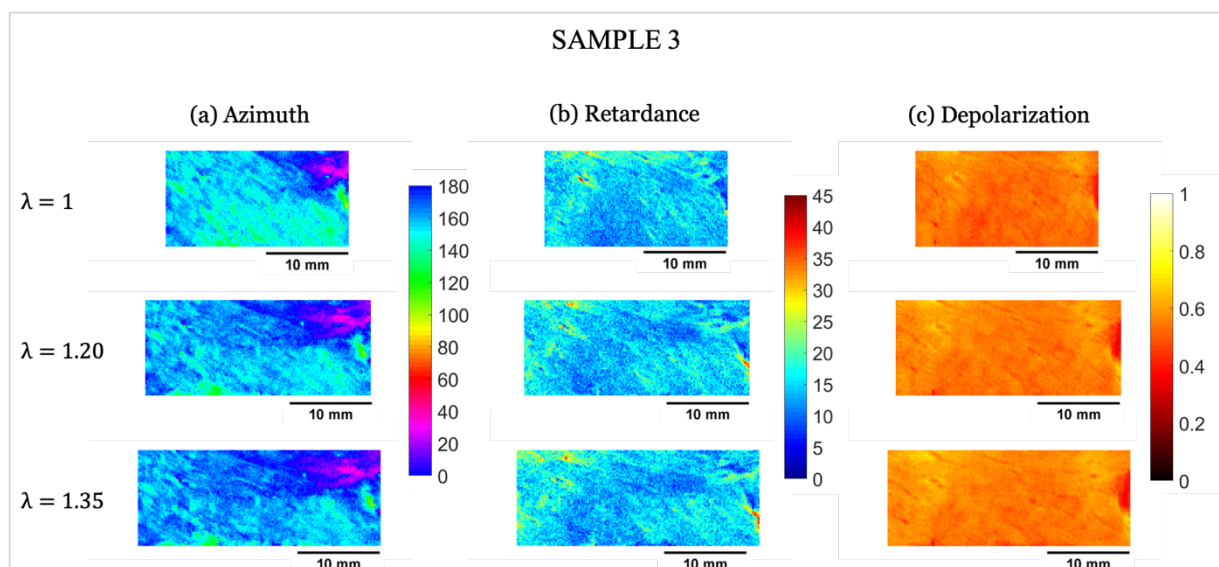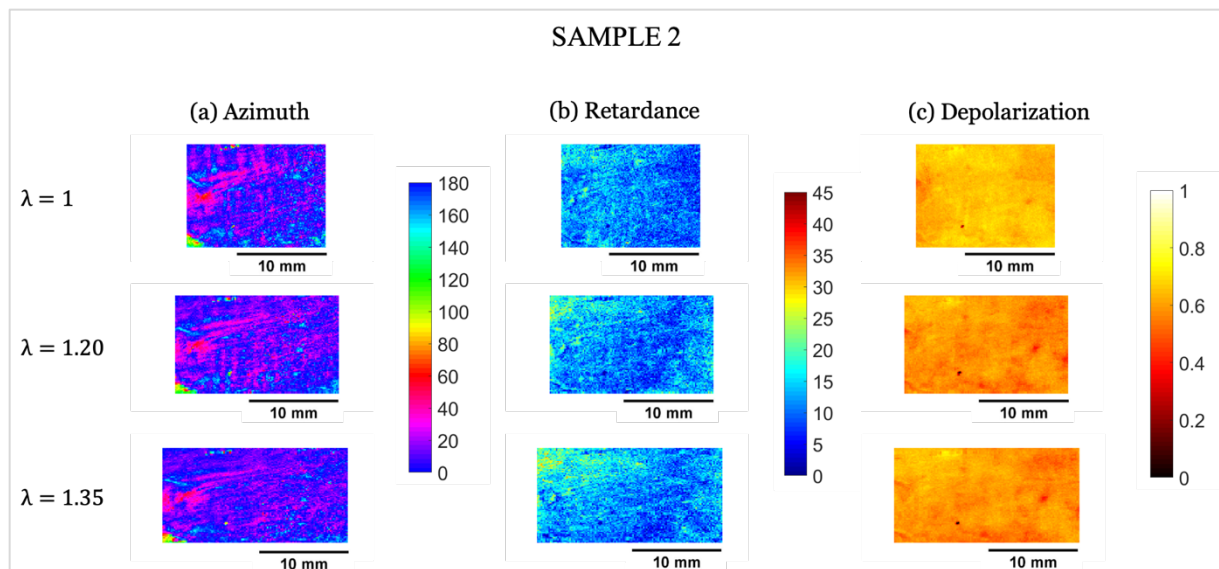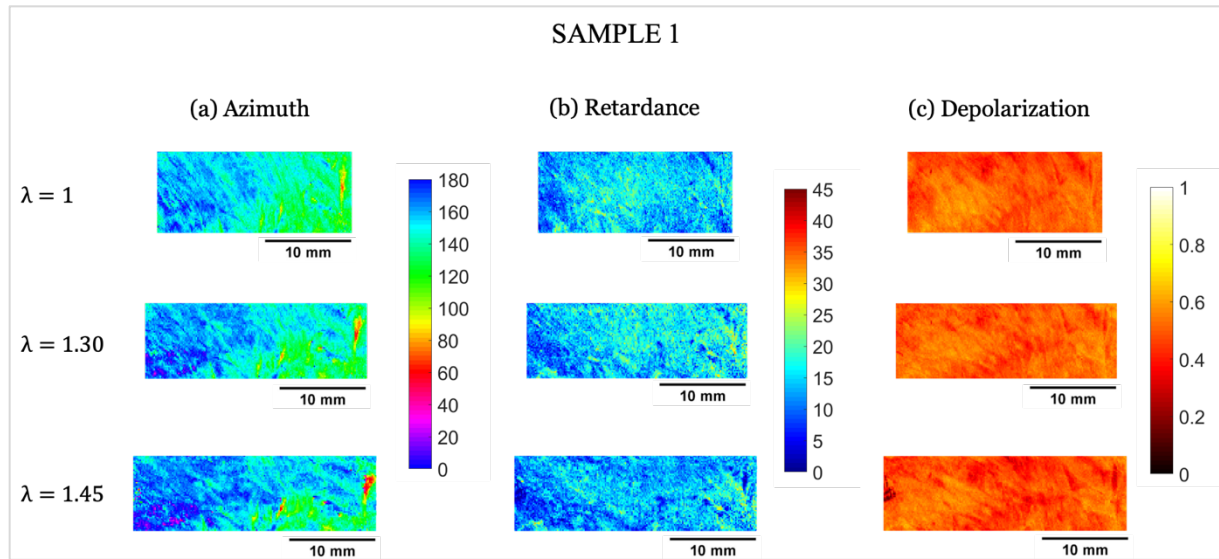

SAMPLE 1'

(a) Top side

(b) Bottom side

(c) Difference

Estimated error: 4.5%

SAMPLE 2'

(a) Top side

(b) Bottom side

(c) Difference

Error estimated: 4.3%

SAMPLE 3'

(a) Top side

(b) Bottom side

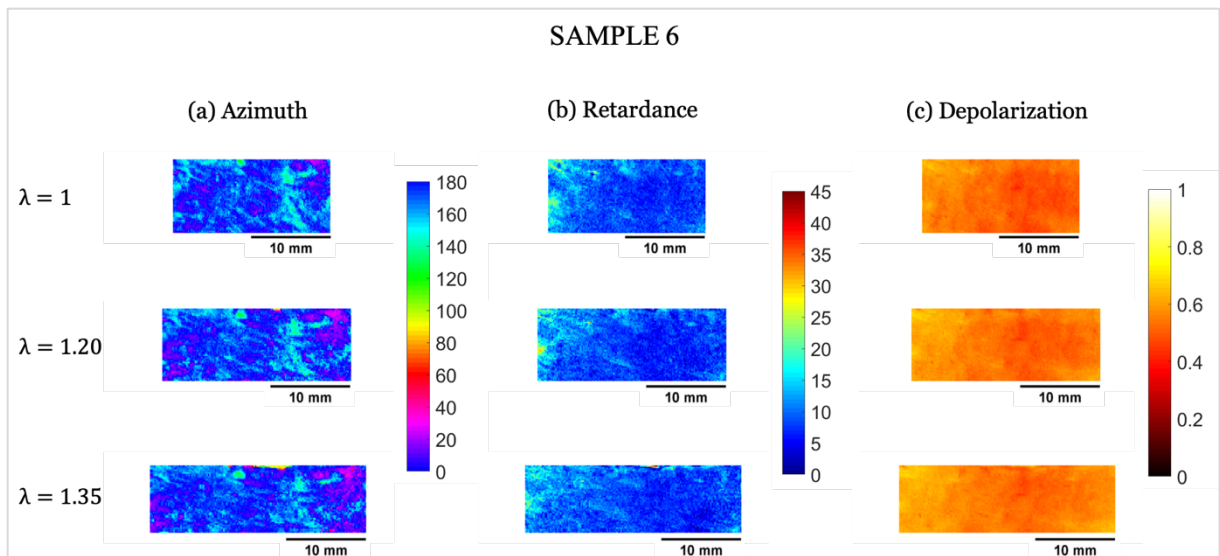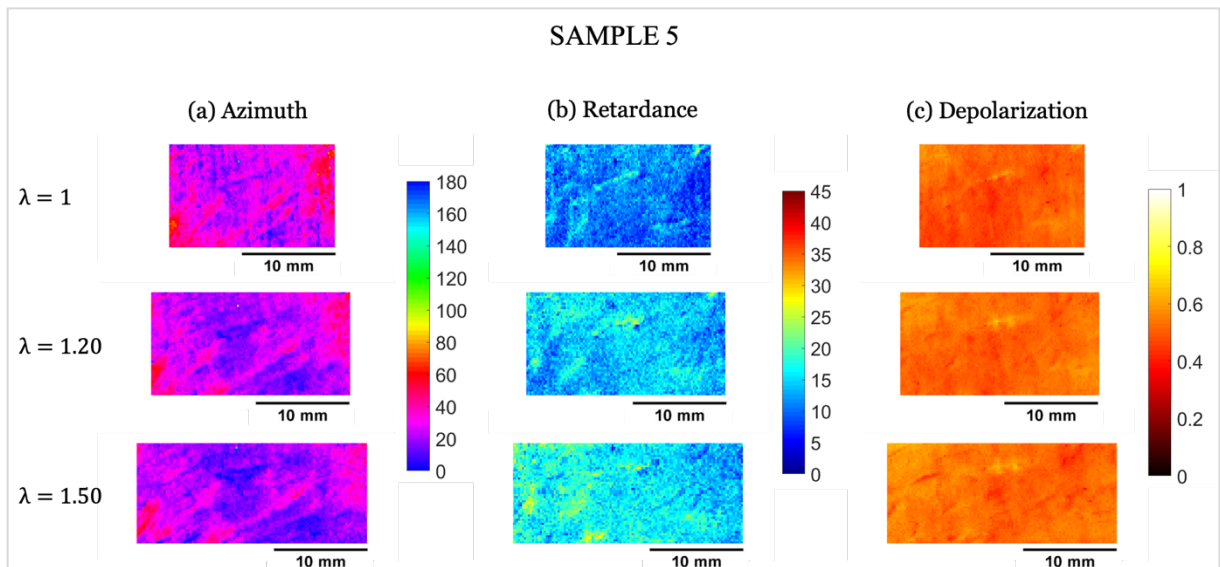(c) Difference

Error estimated: 6.0%

Figure S1. Comparison of the stretch measured by DIC on both sides of the same sample. (a) top and (b) bottom measures of each sample. (c) Difference $C_{top} - C_{bottom}$ of the two measures, as well as the estimation of error on the stretch based on the standard deviation of this difference.

Supplementary figure 2:

SAMPLE 1

(a) Azimuth   (b) Retardance   (c) Depolarization

λ = 1

λ = 1.30

λ = 1.45

SAMPLE 2

(a) Azimuth   (b) Retardance   (c) Depolarization

λ = 1

λ = 1.20

λ = 1.35

SAMPLE 3

(a) Azimuth   (b) Retardance   (c) Depolarization

λ = 1

λ = 1.20

λ = 1.35

SAMPLE 4

(a) Azimuth	(b) Retardance	(c) Depolarization

$\lambda = 1$

$\lambda = 1.20$

$\lambda = 1.35$

10 mm

SAMPLE 5

(a) Azimuth	(b) Retardance	(c) Depolarization

$\lambda = 1$

$\lambda = 1.20$

$\lambda = 1.50$

10 mm

SAMPLE 6

(a) Azimuth	(b) Retardance	(c) Depolarization

$\lambda = 1$

$\lambda = 1.20$

$\lambda = 1.35$

10 mm

SAMPLE 7

(a) Azimuth   (b) Retardance   (c) Depolarization

$\lambda = 1$

$\lambda = 1.15$

$\lambda = 1.25$

SAMPLE 8

(a) Azimuth   (b) Retardance   (c) Depolarization

$\lambda = 1$

$\lambda = 1.20$

$\lambda = 1.40$

SAMPLE 9

(a) Azimuth   (b) Retardance   (c) Depolarization

$\lambda = 1$

$\lambda = 1.20$

$\lambda = 1.40$

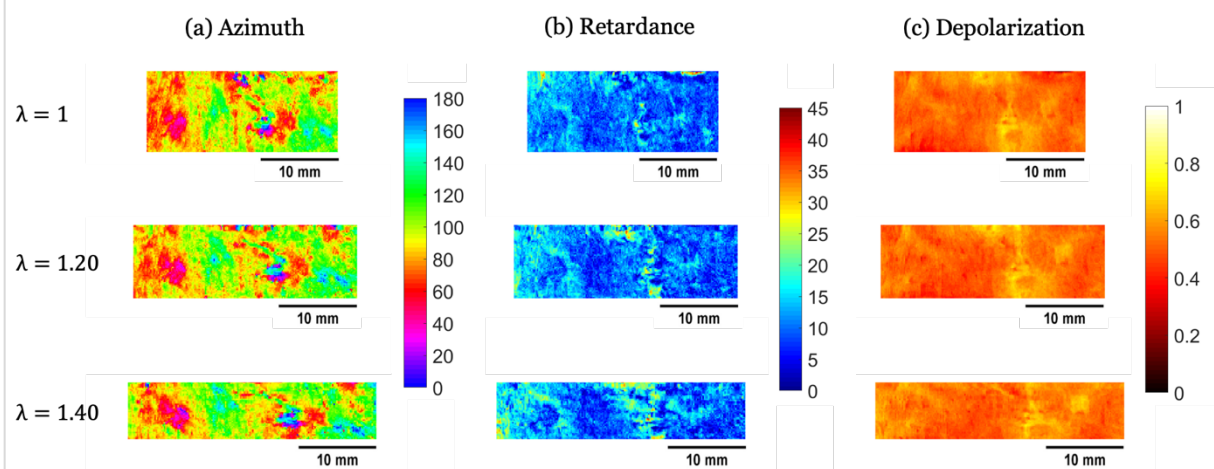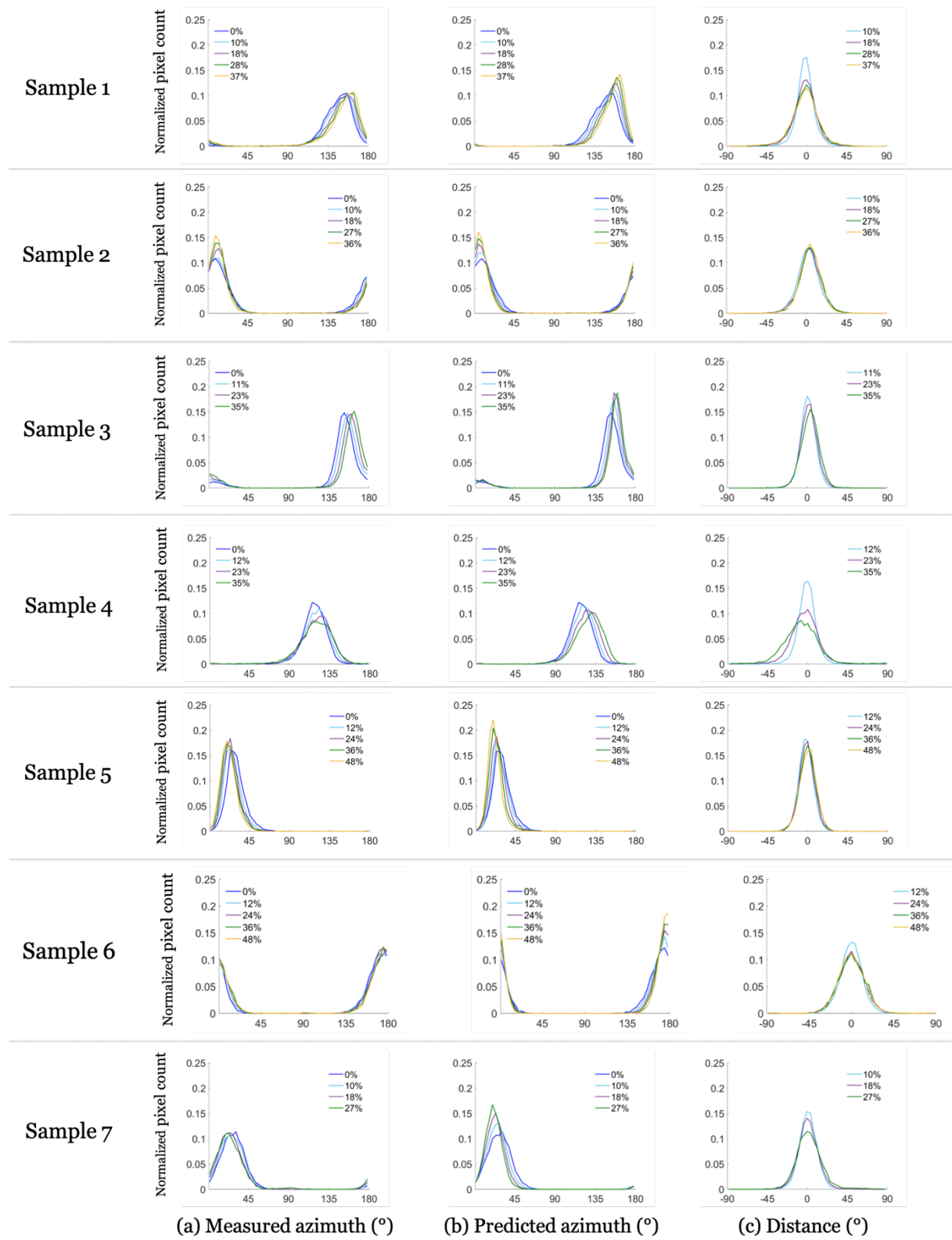**Figure S2.** Maps of the Mueller polarimetry parameters (a - Azimuth (in °), b - Retardance (in °), c - Depolarization) measured at the different imposed stretches (indicated on the left), for all the samples.

Supplementary figure 3:

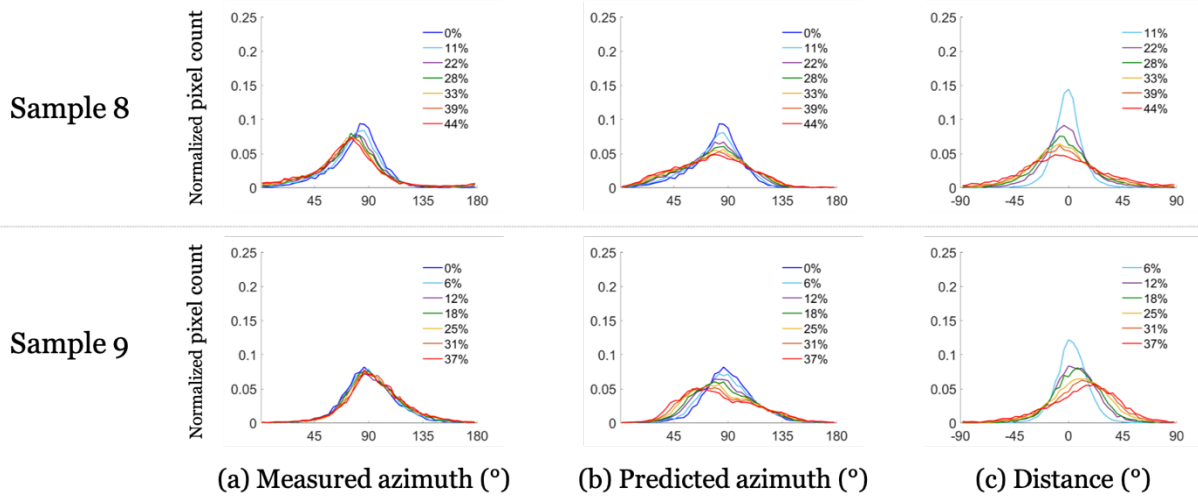(a) Measured azimuth (°)   (b) Predicted azimuth (°)   (c) Distance (°)

Figure S3. Histogram of the polarimetric parameters at different stretch level for each sample. a - Measured azimuth, b - Predicted azimuth, and c - Angular difference between measured and predicted azimuth distributions for each sample. The predicted distributions are obtained using the affine assumption.