Supplementary materials

To check the light transmission depth in our study, wood samples with different thickness were prepared and measured by the same SRS system. Either white reflectance plate or dark plate was put on the other side of the light signal collection side. Fig. S1 shows the light reflectance measurement results. It is evident that over 5 mm thickness the white plate does not work to increase the reflected light intensity. From this result, it suggests that the light transmission depth in Hinoki wood could be around 5 mm.

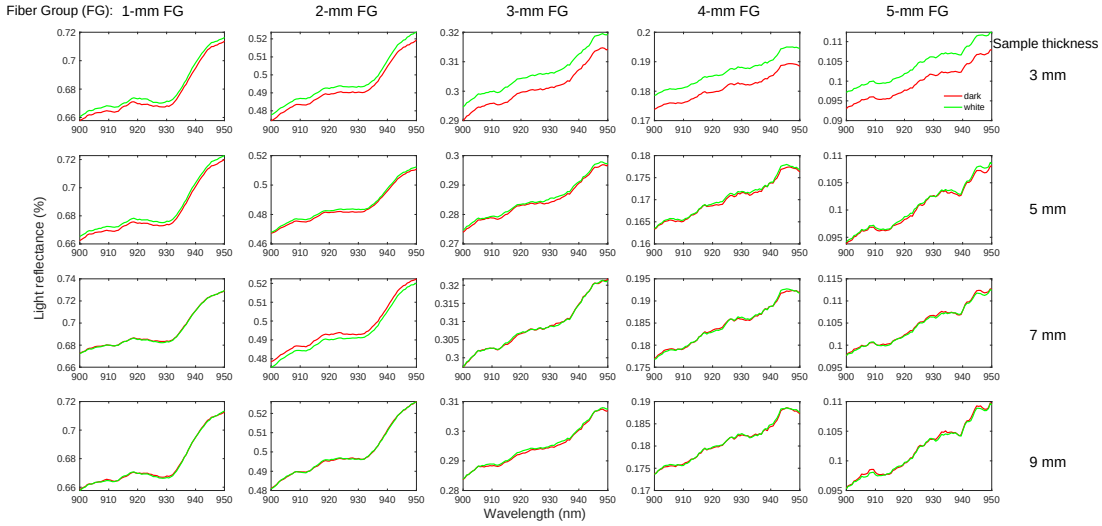

Fig. S1 Wood samples with different thickness from 3 mm to 9 mm were tested to check the light transmission depth

Fig. S2 shows the strain calibration results of the 18 wood samples with the same 5 mm thickness from the PLS regression method. The PLS calibration model had a lower prediction accuracy compared with the 2 mm thickness wood samples. the R^2_{Cal} and $RMSE_{Cal}$ of the calibration set were 0.65 and 471.38 με, respectively. And the R^2_{Val} and $RMSE_{Val}$ of the validation set were 0.53 and 520.79 με, respectively. The number of important wavelengths (VIP scores>1) decreased with the increased light detection distance from light illumination. The PLS regression coefficients respect to the Vis-NIR difference spectra. Totally, approximately 99% of the variance in the SRS spectral data could be explained when the number of 6.

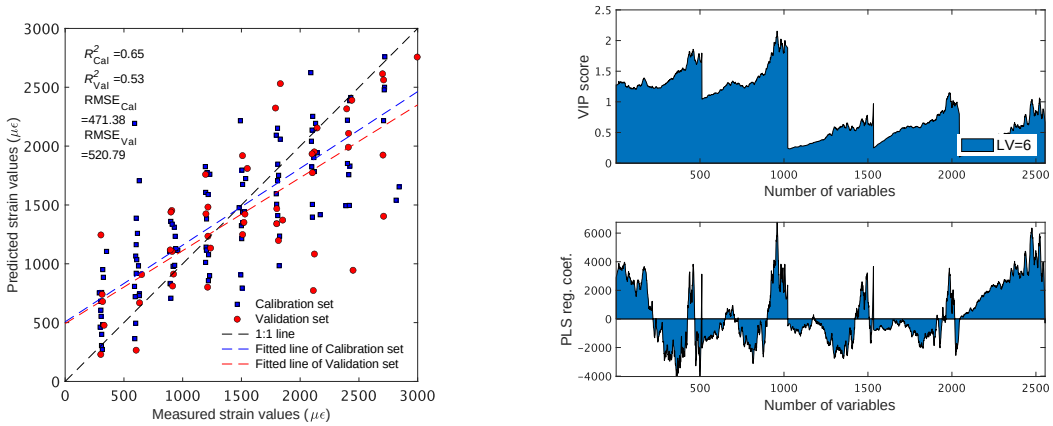

Fig. S2 Scatter plot of measured and predicted strain values using difference spectral data of the wood samples with the same 5 mm thickness.