

## Supporting Information

### Visualization of the In-situ Distribution of Contents and Hydrogen Bonding States of Cellular level Water in Apple Tissues by Confocal Raman Microscopy

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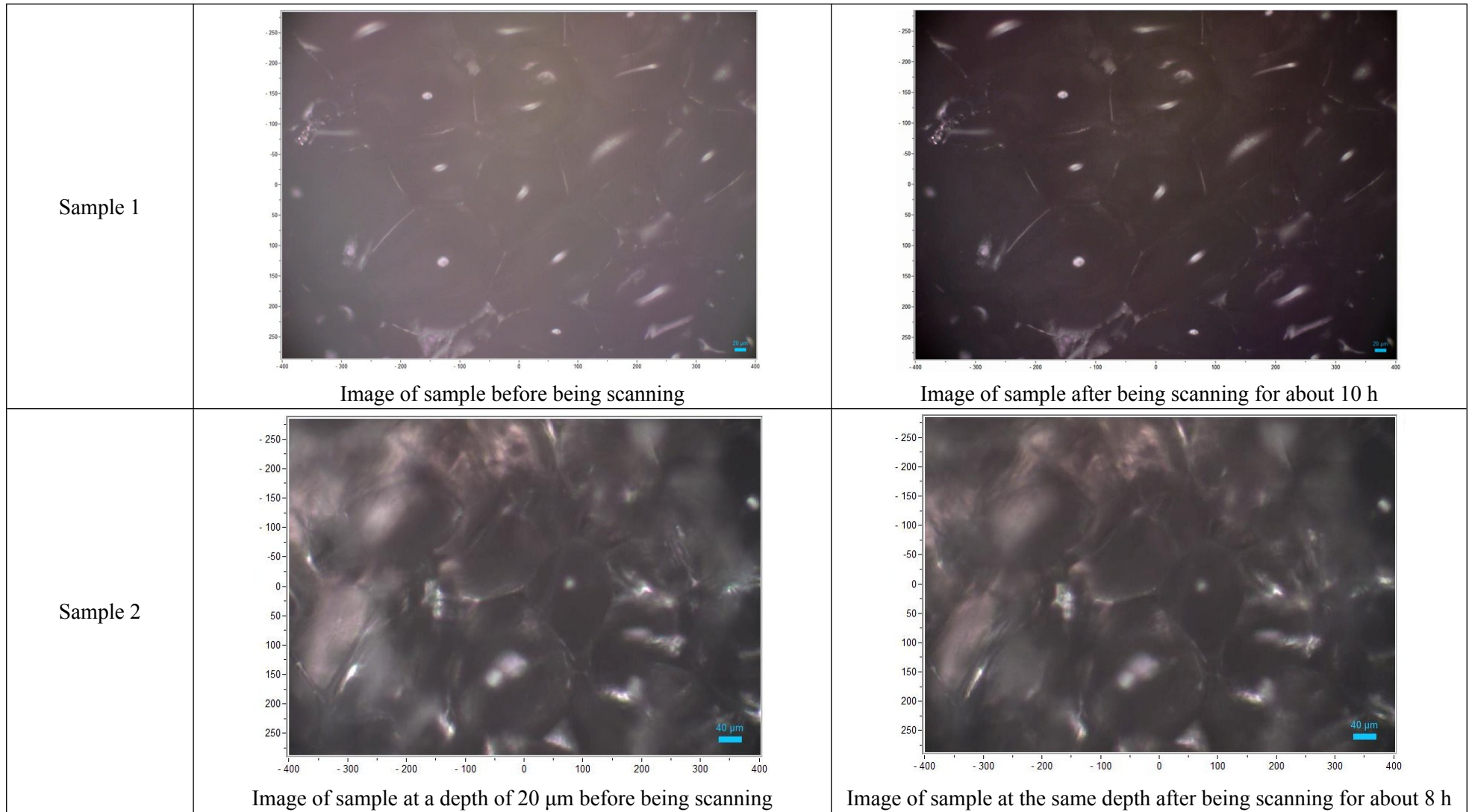
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Sample 3

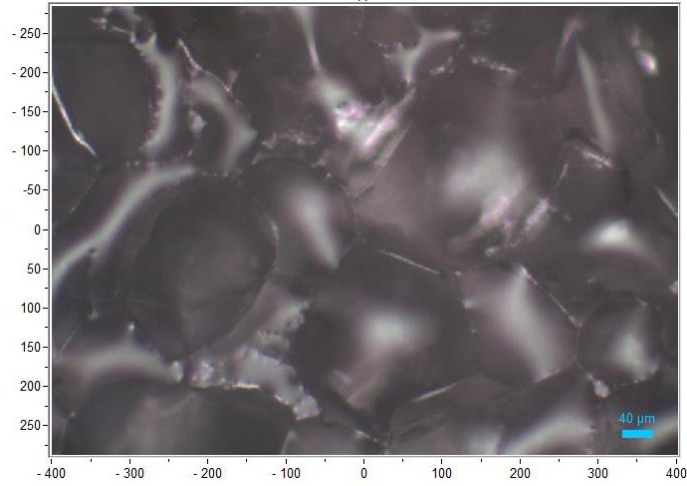


Image of sample before being scanning

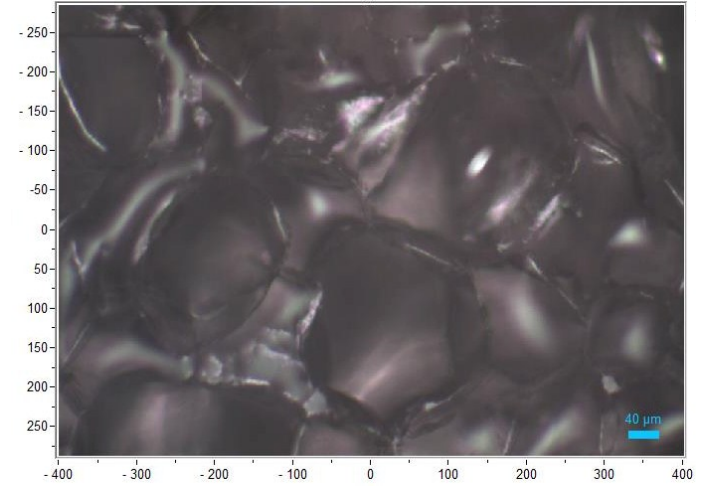


Image of sample after being scanning for about 4.5 h

Sample 4

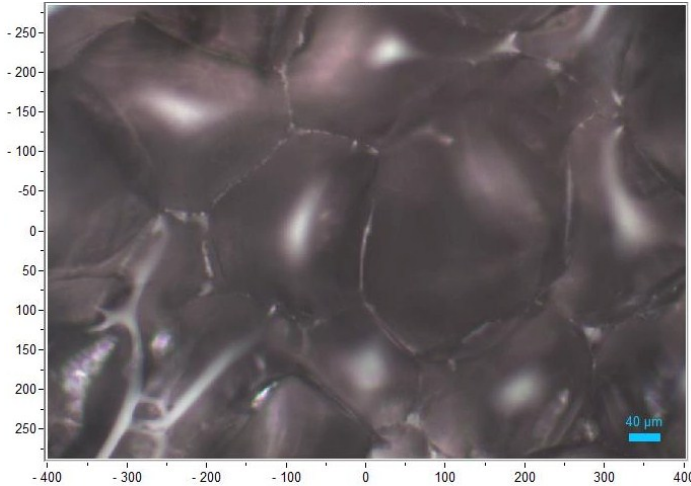


Image of sample before being scanning

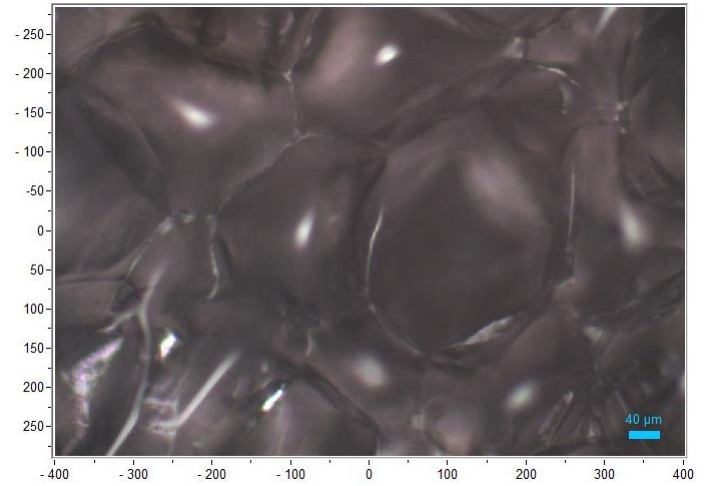


Image of sample after being scanning for about 4 h

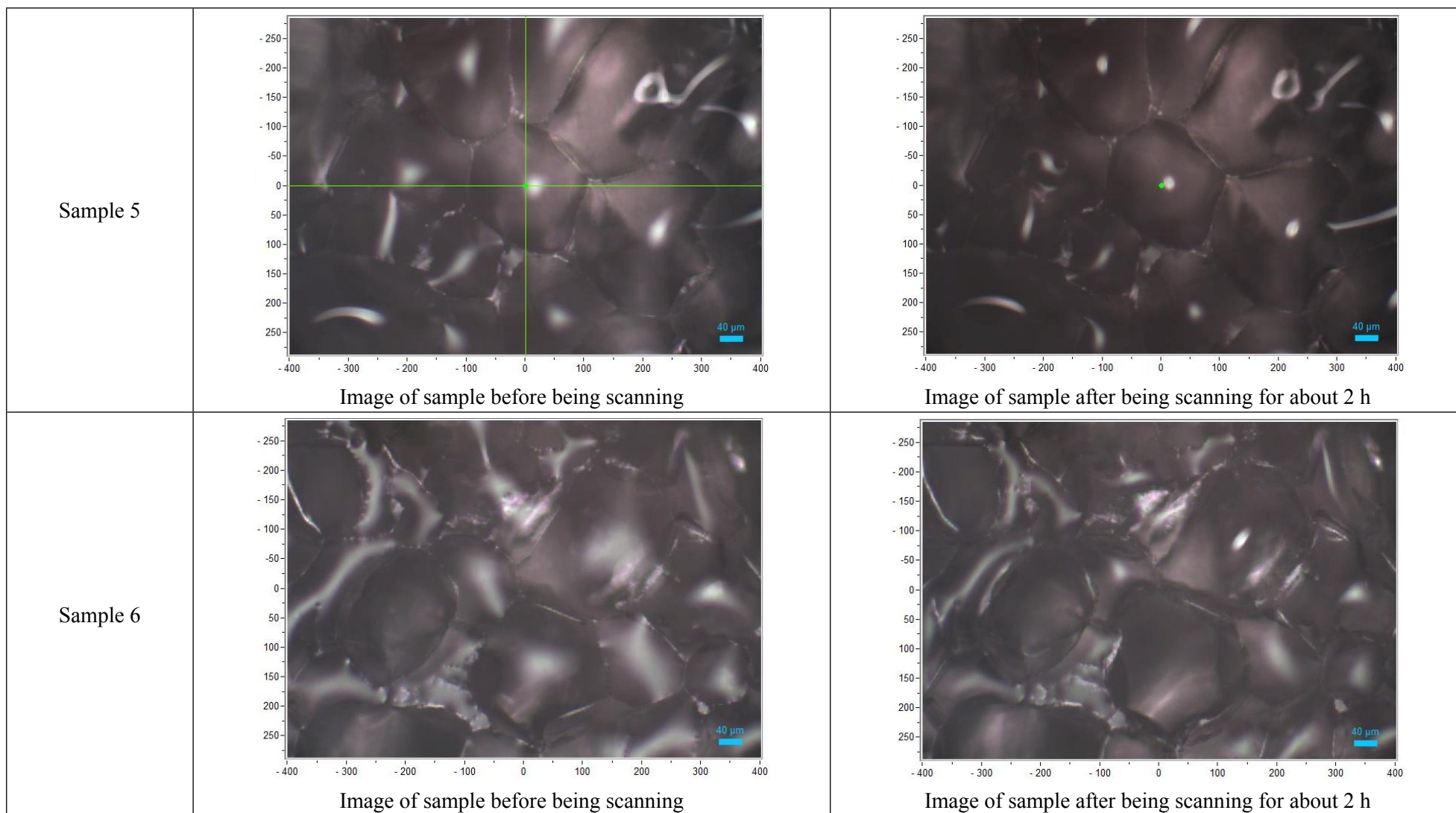


Fig.S1 Comparison of images of samples before and after being scanning by CRM.

Table S1. The fitting results of the Raman spectra of the deionized water in each scanning, including the position and area of each sub-peak and the overlapping peak.

No	Peak position					Area ratio of Peak III and Peak II	Number of hydrogen bonds of each water molecule	Average coefficient of determination
	Peak I /cm <sup>-1</sup>	Peak II /cm <sup>-1</sup>	Peak III /cm <sup>-1</sup>	Peak IV /cm <sup>-1</sup>	Peak V /cm <sup>-1</sup>			
1	3069.76±4.86 <sup>a</sup>	3218.80±0.82 <sup>a</sup>	3408.98±2.22 <sup>a</sup>	3541.46±3.60 <sup>a</sup>	3630.04±0.85 <sup>a</sup>	1.68±0.01 <sup>a</sup>	2.69±0.00 <sup>a</sup>	0.99997
2	3071.99±4.01 <sup>a</sup>	3219.75±1.10 <sup>a</sup>	3408.88±4.92 <sup>a</sup>	3540.75±4.75 <sup>a</sup>	3630.48±2.47 <sup>a</sup>	1.68±0.01 <sup>a</sup>	2.69±0.00 <sup>a</sup>	0.99997
3	3072.82±6.99 <sup>a</sup>	3218.57±0.86 <sup>a</sup>	3408.38±5.65 <sup>a</sup>	3540.54±4.43 <sup>a</sup>	3629.62±2.17 <sup>a</sup>	1.68±0.02 <sup>a</sup>	2.69±0.01 <sup>a</sup>	0.99996
4	3067.43±4.16 <sup>a</sup>	3218.92±1.03 <sup>a</sup>	3410.10±1.58 <sup>a</sup>	3543.46±2.74 <sup>a</sup>	3630.32±0.94 <sup>a</sup>	1.69±0.01 <sup>a</sup>	2.69±0.00 <sup>a</sup>	0.99997
5	3070.12±6.95 <sup>a</sup>	3219.26±0.90 <sup>a</sup>	3410.05±3.42 <sup>a</sup>	3543.42±5.71 <sup>a</sup>	3630.21±1.62 <sup>a</sup>	1.68±0.00 <sup>a</sup>	2.69±0.00 <sup>a</sup>	0.99997
6	3070.91±4.80 <sup>a</sup>	3217.96±2.06 <sup>a</sup>	3407.38±4.45 <sup>a</sup>	3538.96±5.75 <sup>a</sup>	3629.11±1.35 <sup>a</sup>	1.67±0.02 <sup>a</sup>	2.69±0.00 <sup>a</sup>	0.99995
7	3068.01±4.17 <sup>a</sup>	3215.98±1.49 <sup>a</sup>	3409.17±2.07 <sup>a</sup>	3542.93±1.97 <sup>a</sup>	3630.27±0.67 <sup>a</sup>	1.64±0.02 <sup>a</sup>	2.69±0.00 <sup>a</sup>	0.99994
8	3068.59±4.16 <sup>a</sup>	3216.04±1.64 <sup>a</sup>	3406.78±2.41 <sup>a</sup>	3539.90±2.99 <sup>a</sup>	3629.18±0.76 <sup>a</sup>	1.64±0.01 <sup>a</sup>	2.69±0.00 <sup>a</sup>	0.99994
9	3067.38±7.42 <sup>a</sup>	3216.56±2.94 <sup>a</sup>	3406.49±3.54 <sup>a</sup>	3537.63±3.01 <sup>a</sup>	3628.63±0.51 <sup>a</sup>	1.63±0.01 <sup>a</sup>	2.69±0.01 <sup>a</sup>	0.99993
10	3069.59±5.01 <sup>a</sup>	3217.33±5.44 <sup>a</sup>	3406.57±6.74 <sup>a</sup>	3538.47±6.65 <sup>a</sup>	3628.11±1.79 <sup>a</sup>	1.64±0.02 <sup>a</sup>	2.69±0.01 <sup>a</sup>	0.99993
11	3069.07±5.11 <sup>a</sup>	3217.87±1.51 <sup>a</sup>	3409.15±4.70 <sup>a</sup>	3541.77±6.42 <sup>a</sup>	3629.27±1.57 <sup>a</sup>	1.70±0.03 <sup>a</sup>	2.69±0.01 <sup>a</sup>	0.99996
12	3073.74±6.69 <sup>a</sup>	3217.04±1.19 <sup>a</sup>	3405.39±3.12 <sup>a</sup>	3538.19±5.01 <sup>a</sup>	3628.76±1.57 <sup>a</sup>	1.69±0.02 <sup>a</sup>	2.69±0.00 <sup>a</sup>	0.99996
13	3071.65±3.95 <sup>a</sup>	3217.88±0.94 <sup>a</sup>	3407.84±2.82 <sup>a</sup>	3539.74±5.33 <sup>a</sup>	3629.00±1.79 <sup>a</sup>	1.67±0.02 <sup>a</sup>	2.70±0.01 <sup>a</sup>	0.99994
14	3071.42±3.39 <sup>a</sup>	3217.64±0.87 <sup>a</sup>	3407.73±2.98 <sup>a</sup>	3541.93±5.09 <sup>a</sup>	3629.97±1.08 <sup>a</sup>	1.68±0.01 <sup>a</sup>	2.70±0.00 <sup>a</sup>	0.99994

15	3076.03±5.23 <sup>a</sup>	3217.58±0.29 <sup>a</sup>	3406.76±4.83 <sup>a</sup>	3540.68±4.62 <sup>a</sup>	3629.97±1.55 <sup>a</sup>	1.66±0.01 <sup>a</sup>	2.70±0.00 <sup>a</sup>	0.99994
16	3073.16±3.61 <sup>a</sup>	3218.69±1.42 <sup>a</sup>	3405.55±4.28 <sup>a</sup>	3537.07±2.71 <sup>a</sup>	3629.10±1.62 <sup>a</sup>	1.68±0.01 <sup>a</sup>	2.70±0.01 <sup>a</sup>	0.99995
17	3069.18±5.00 <sup>a</sup>	3217.46±0.72 <sup>a</sup>	3407.92±3.95 <sup>a</sup>	3541.92±5.94 <sup>a</sup>	3630.03±1.46 <sup>a</sup>	1.69±0.01 <sup>a</sup>	2.70±0.00 <sup>a</sup>	0.99994
18	3068.68±4.73 <sup>a</sup>	3217.40±0.53 <sup>a</sup>	3408.99±4.75 <sup>a</sup>	3544.40±2.51 <sup>a</sup>	3630.72±1.49 <sup>a</sup>	1.69±0.01 <sup>a</sup>	2.69±0.00 <sup>a</sup>	0.99994
19	3075.23±3.68 <sup>a</sup>	3217.44±0.91 <sup>a</sup>	3405.48±3.33 <sup>a</sup>	3537.57±4.42 <sup>a</sup>	3628.79±0.78 <sup>a</sup>	1.69±0.01 <sup>a</sup>	2.70±0.00 <sup>a</sup>	0.99994
20	3075.69±6.09 <sup>a</sup>	3216.94±0.37 <sup>a</sup>	3405.52±3.47 <sup>a</sup>	3539.50±3.60 <sup>a</sup>	3629.49±0.51 <sup>a</sup>	1.68±0.01 <sup>a</sup>	2.70±0.00 <sup>a</sup>	0.99995
Average	3071.02±2.71	3217.75±1.01	3407.66±1.54	3540.51±2.15	3629.55±0.71	1.67±0.01	2.69±0.00	0.99995

<sup>a</sup> the same letter in a column indicates no significant difference (P<0.05) in each scanning.