



KONTROLA BEZ RAZARANJA KOMPOZITA TEMELJENA NA AKTIVNOJ INFRACRVENOJ TERMOGRAFIJI I ULTRAZVUČNOM ISPITIVANJU

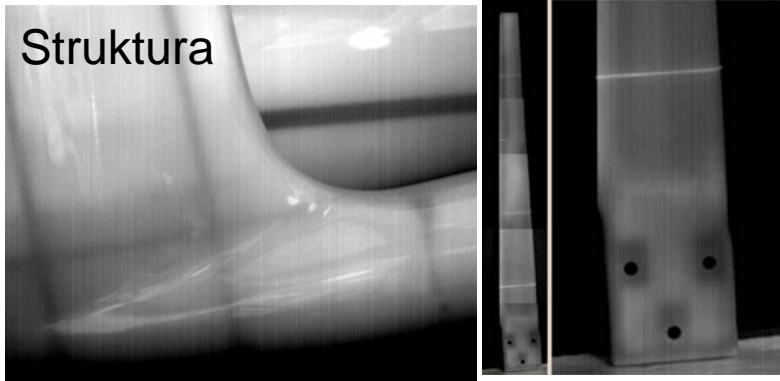
Autori:

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Fakultet elektrotehnike, strojarstva i brodogradnje, Sveučilište u Spitu
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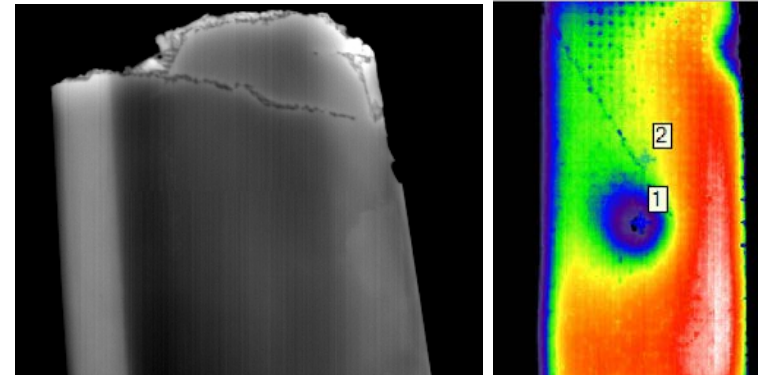
Pulsna termografija



Struktura

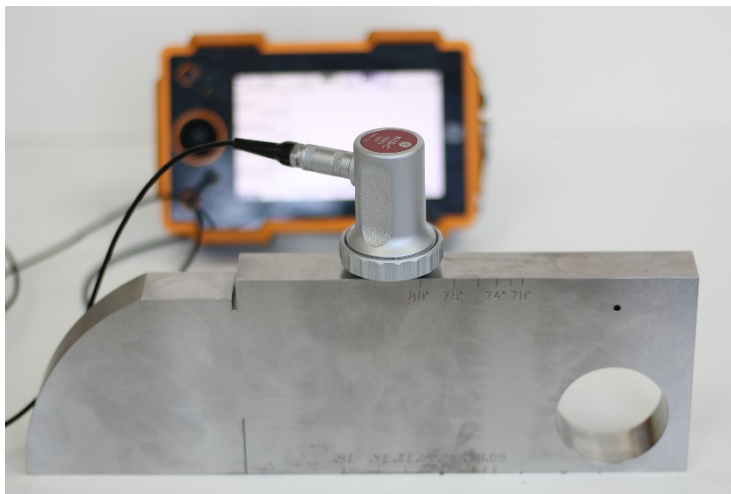


Oštećenja

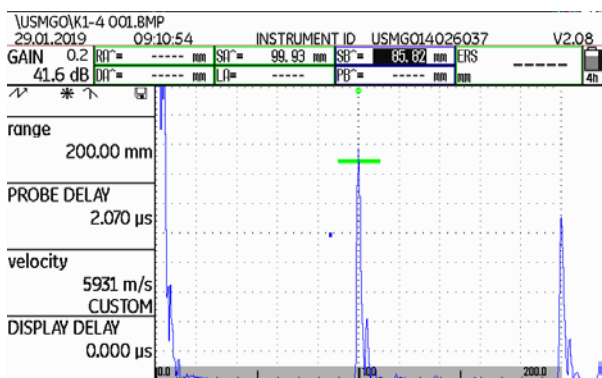


Osmoza

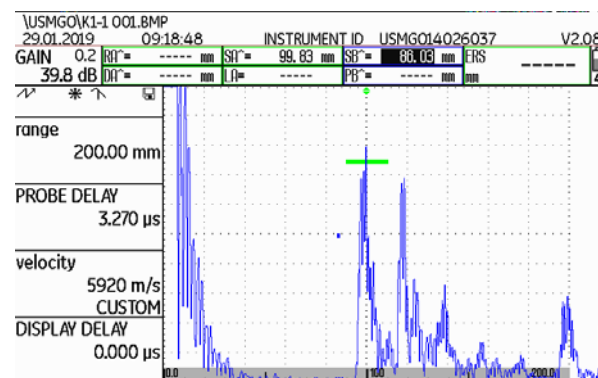




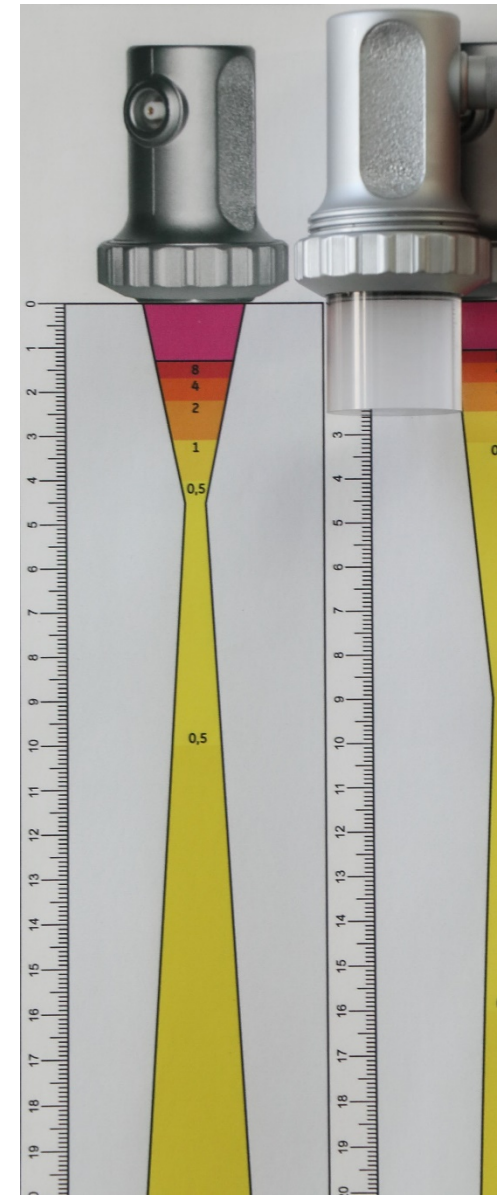
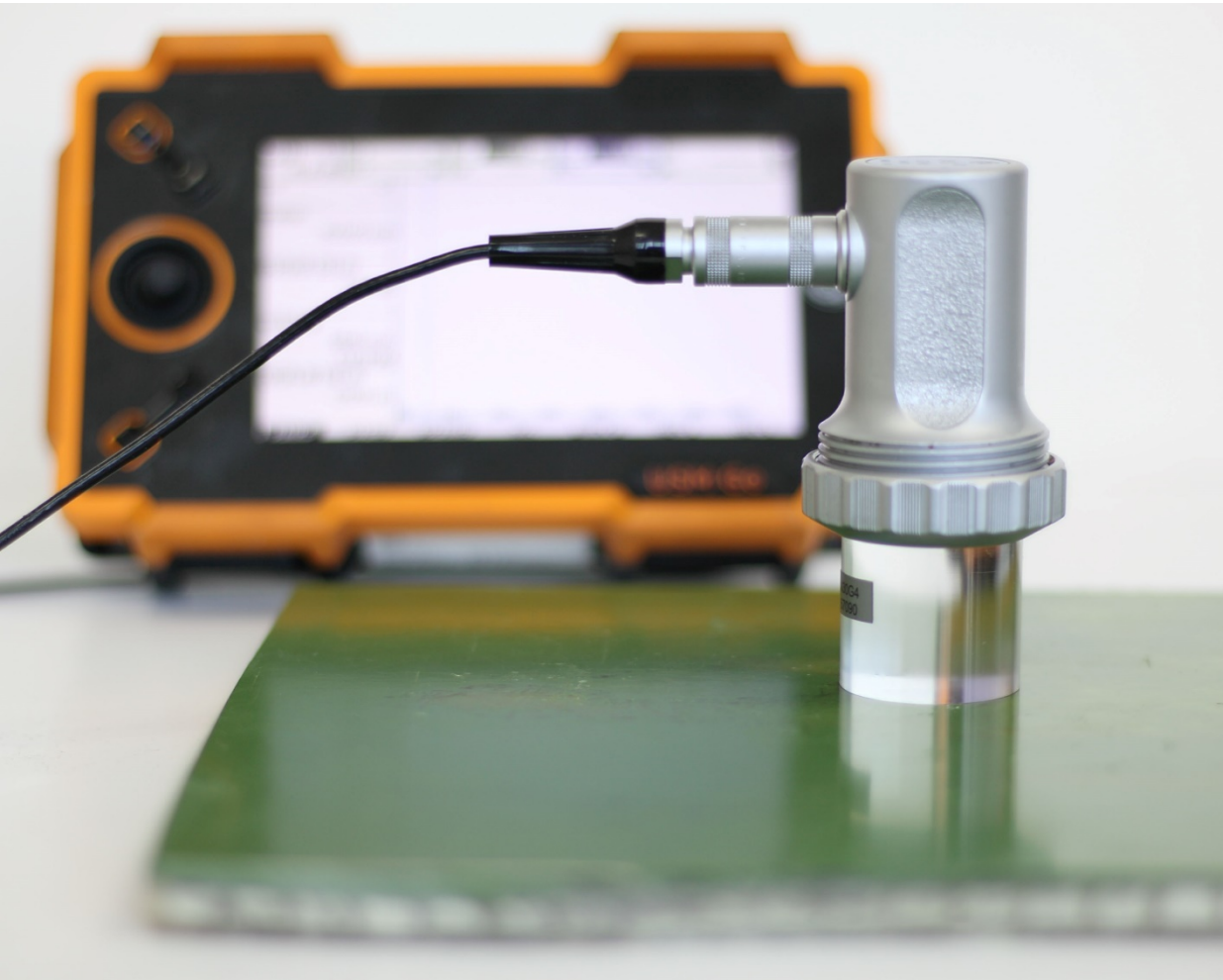
4 MHz sonda na kalibracijskom bloku:

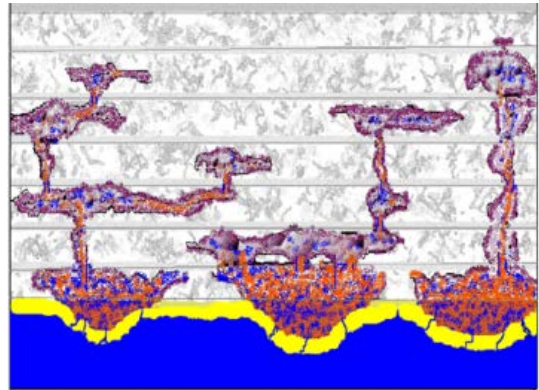
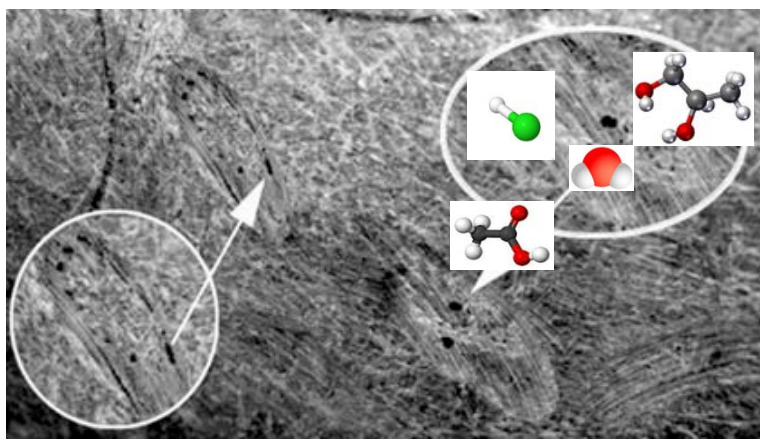


1 MHz sonda na kalibracijskom bloku:



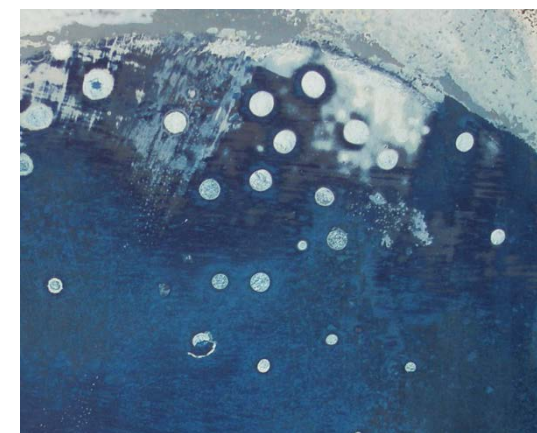
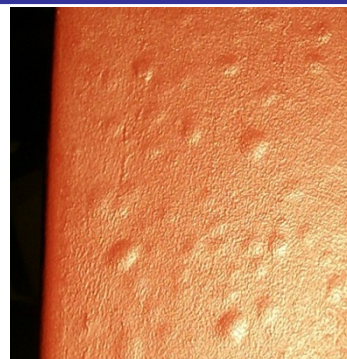
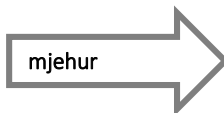
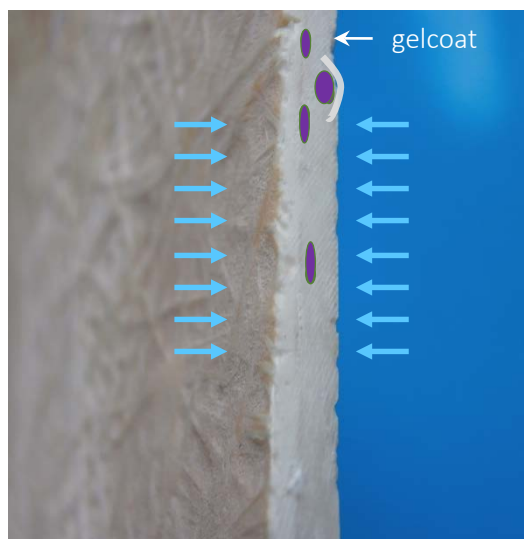
Blok za kašnjenje (PROBE DELAY)





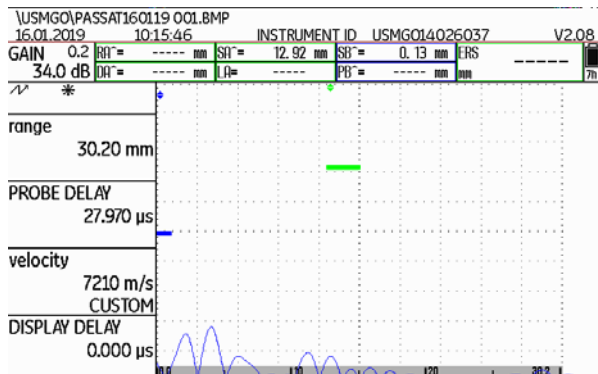


Proces nastanka osmotskih oštećenja

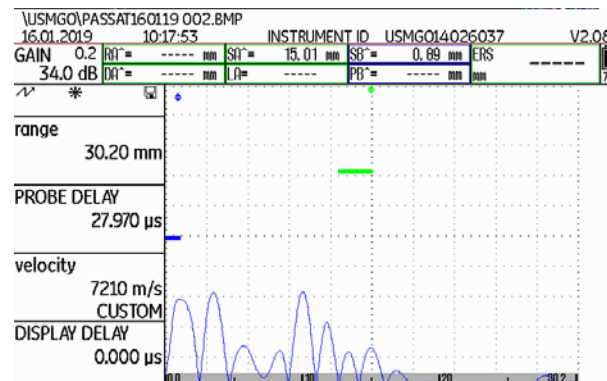


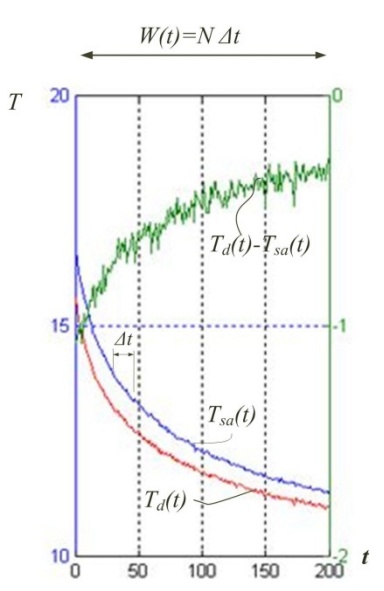


1MHz snop kroz mjehur:

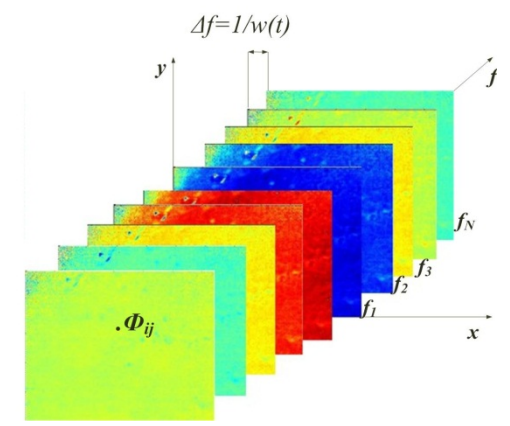
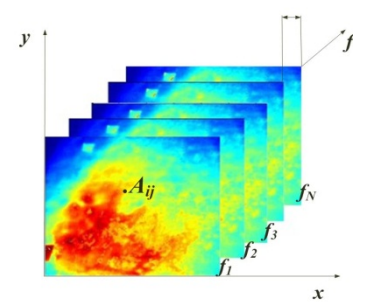
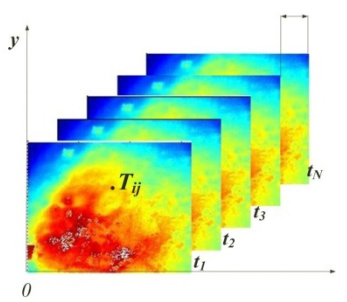
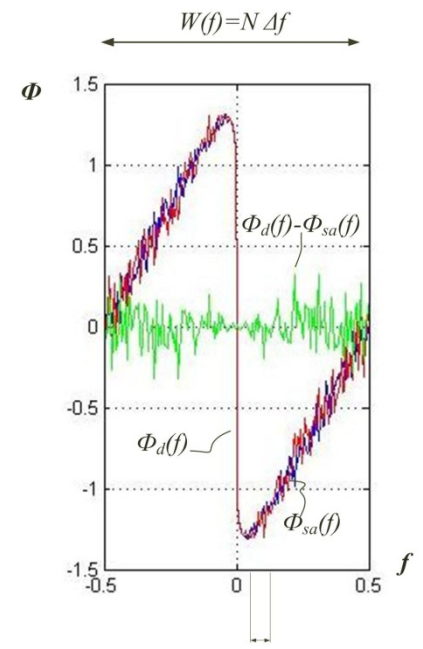
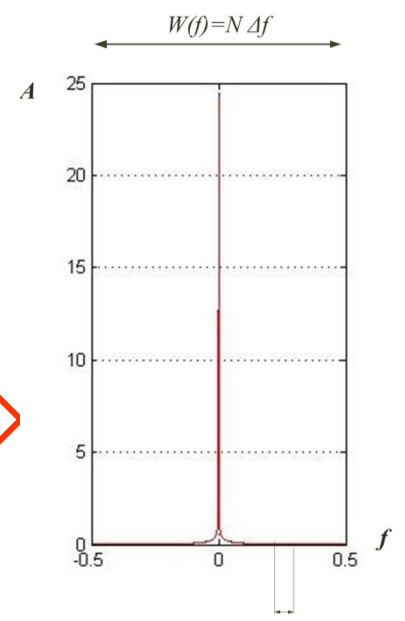


1 MHz snop kroz zdravi materijal:





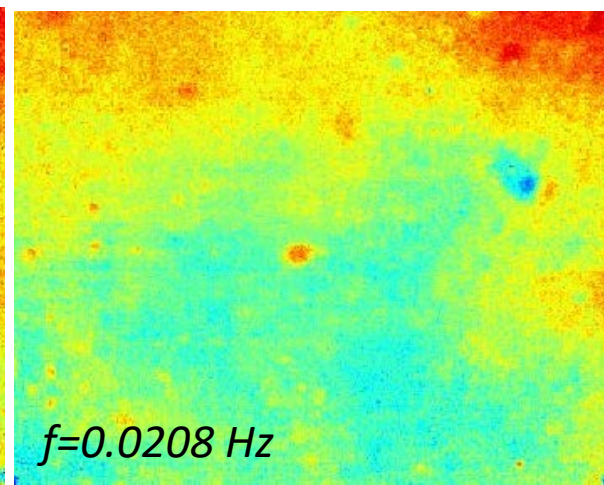
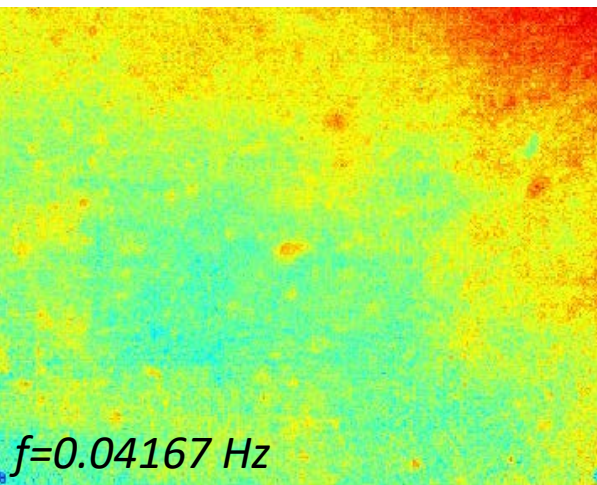
FFT



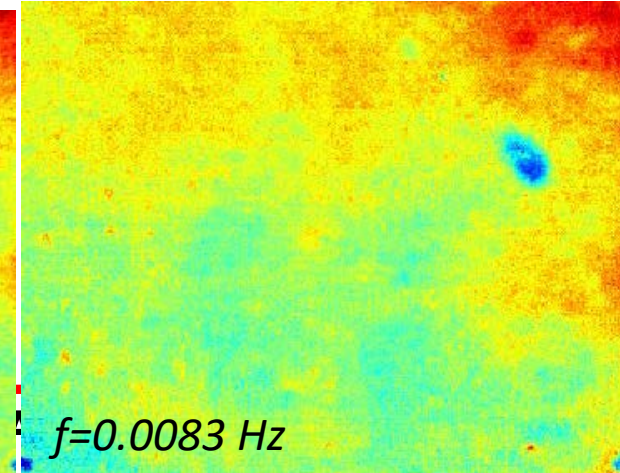
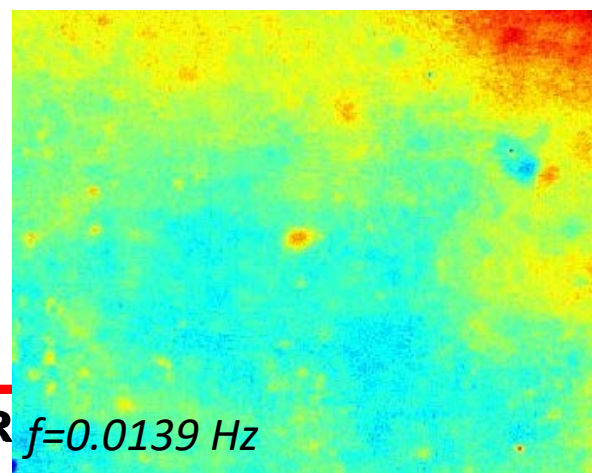
Jean Baptiste Fourier
1768-1830

Amplitudegram: $A_{tw}(x, y) = \sqrt{[S_1(x, y) - S_3(x, y)]^2 + [S_2(x, y) - S_4(x, y)]^2}$

Fazegram: $\phi_{tw} = \arctan \frac{S_1(x, y) - S_3(x, y)}{S_2(x, y) - S_4(x, y)}$

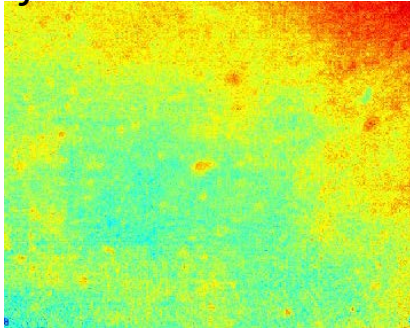


HRVATSKA KOMORA $f=0.0139 \text{ Hz}$

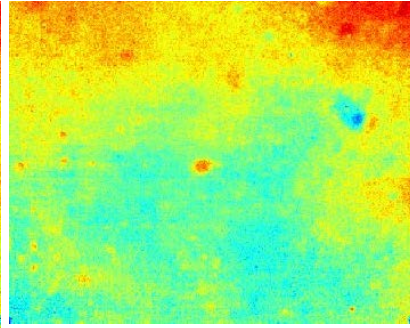




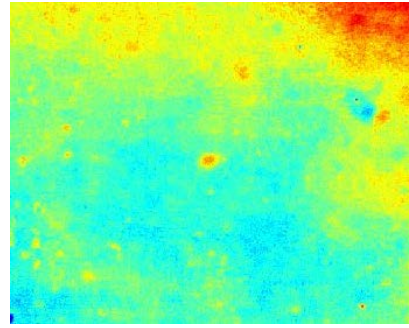
$f=0.04167$ Hz:



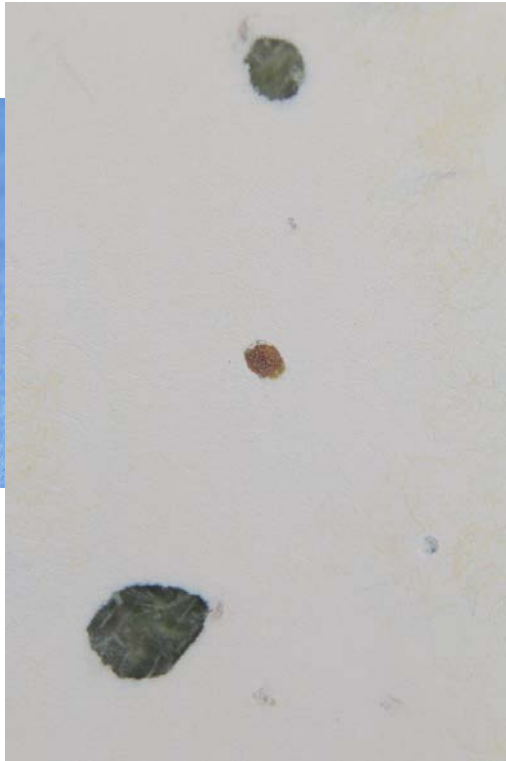
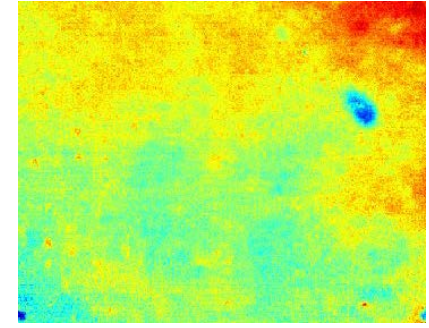
$f=0.0208$ Hz:



$f=0.0139$ Hz:

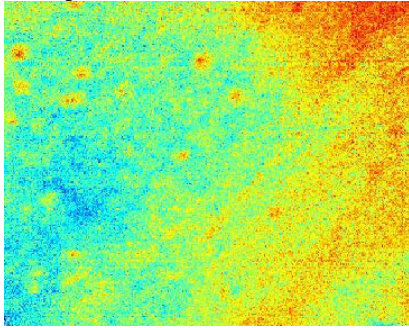


$f=0.0083$ Hz:

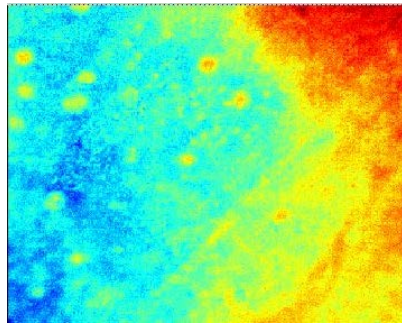




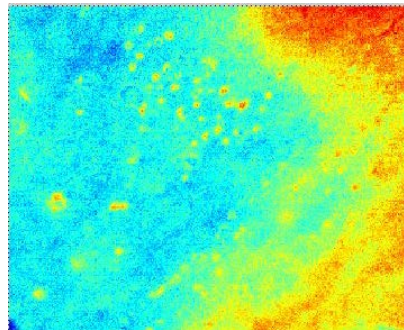
$f=0.04167$ Hz:



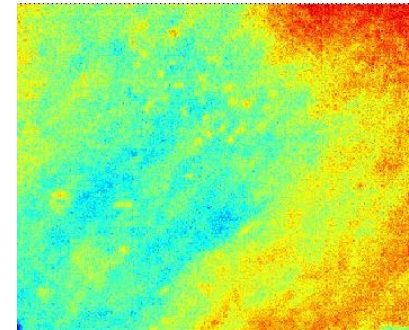
$f=0.0208$ Hz:



$f=0.0139$ Hz:



$f=0.0083$ Hz:





Zaključak:

- demonstrirana metoda KBR kod stakloplastike
- uvijek preporuka koristiti dvije metode (IC + UT)
- matematička (FFT) obrada signala daje puno više informacija od sirovog termograma
- osmoza – ekstrem u KBR, moguće primijeniti metodu





HVALA NA POZORNOSTI !

Autori:

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