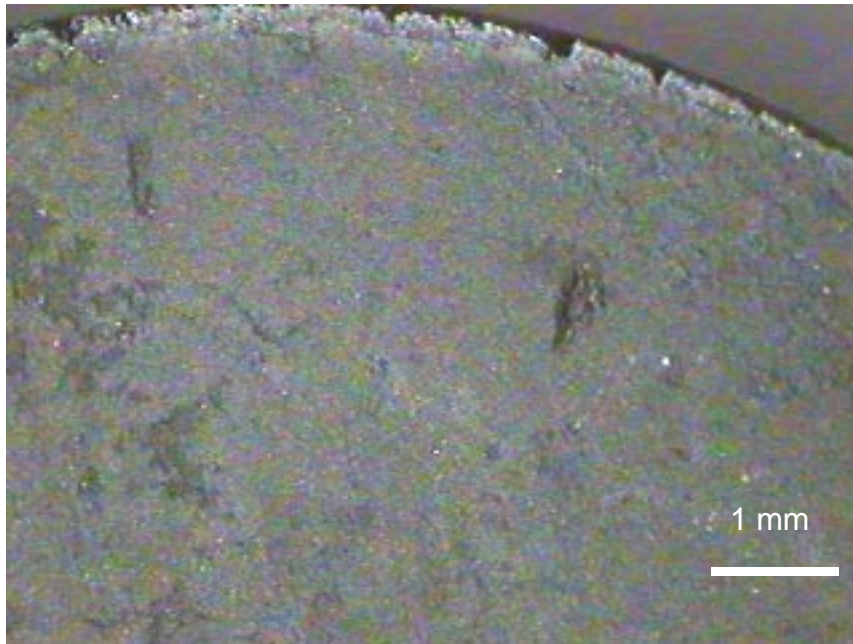
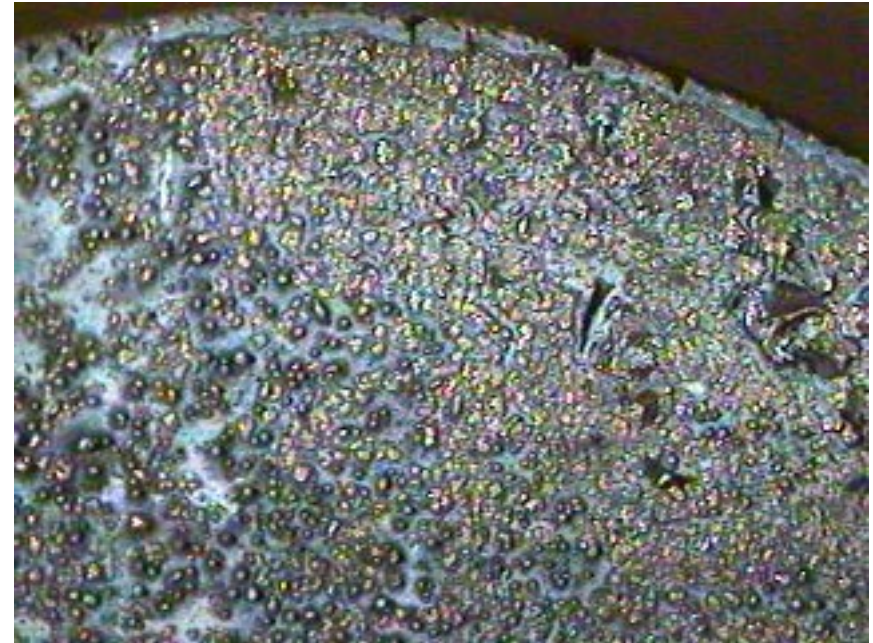

Be/C layer appears to form 'beads' in response to heat flux.

JET tile IN3-16 (vertical tile, inner divertor) before Nd laser scan



After laser scans



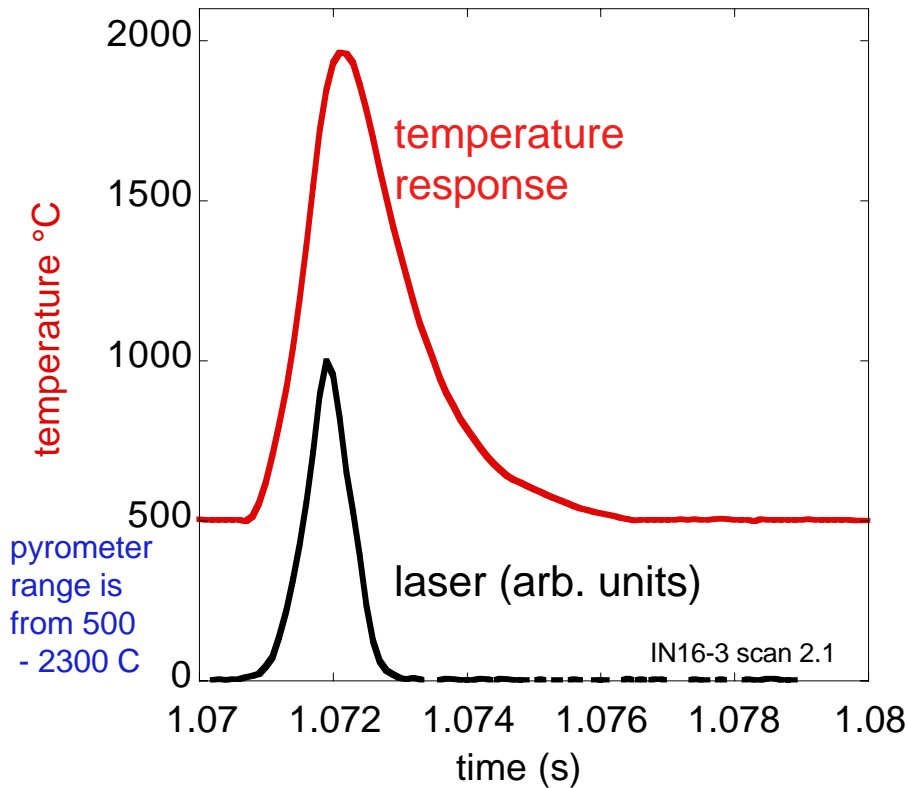
'Globules' of Be formed after laser heating.

21 temperature excursions above 1000 C, peak temperature 2,100 C.

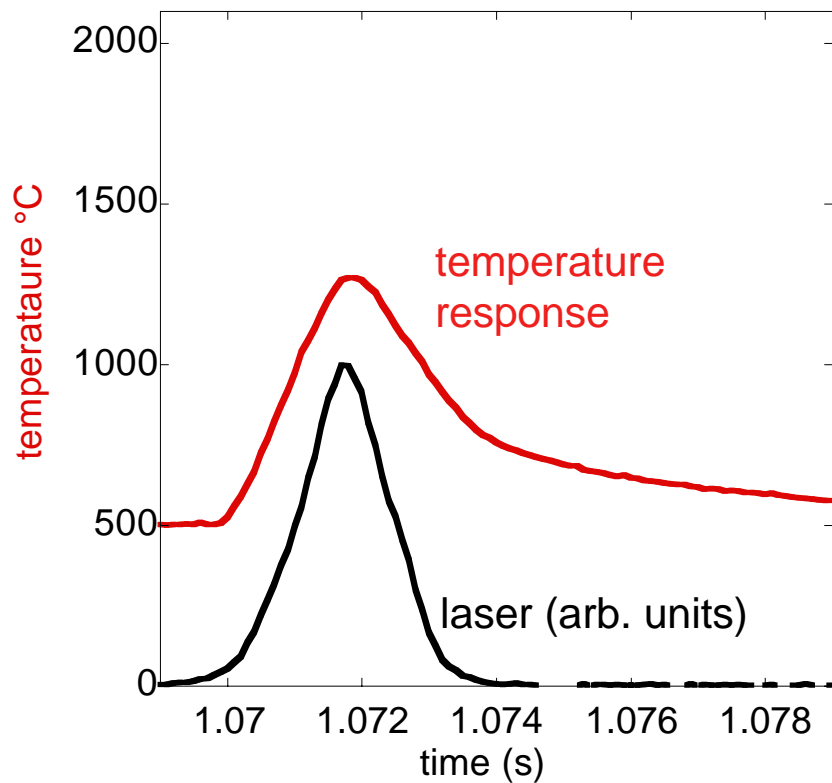
Subsequent scans at same laser power and speed resulted in lower temperatures (1,601 C then 1,314 C) as layer became more thermally conducting similar to the manufactured material.

Other codeposits (without Be) did not show this major temperature decrease.

Thermal response of Be/C material:



1st laser scan.
Duration over point 0.8 ms FWHM
temperature rises to 1963 °C.



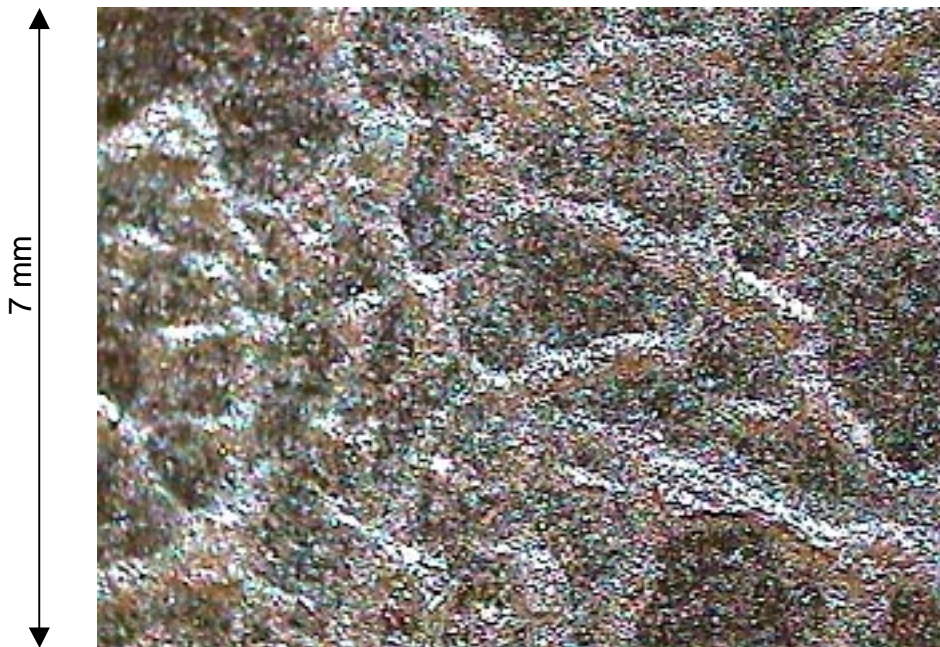
20th heat pulse over same area.
scan speed reduced x2; pulse 1.6 ms.
temperature rise only 1270 °C

- surface has changed....

Illustrates potential for 'surprises'
with mixed materials - and underlines
case for operating current tokamak with ITER materials

Thermal response of ion damaged tungsten

W sample implanted with $1e21$ D @ 200 eV
(courtesy of J. Roth).



low power x4
optical microscope

Ion implantation features change thermal response.
- PFC surfaces manufactured by tokamak and
may not have same properties
as factory-manufactured material.

Use scanning Nd laser to transiently heat
(laser has smooth focal spot)

During laser scan



W_03still.jpeg

200eV D+ 1e21 raster 1 zone 1 speed 100

