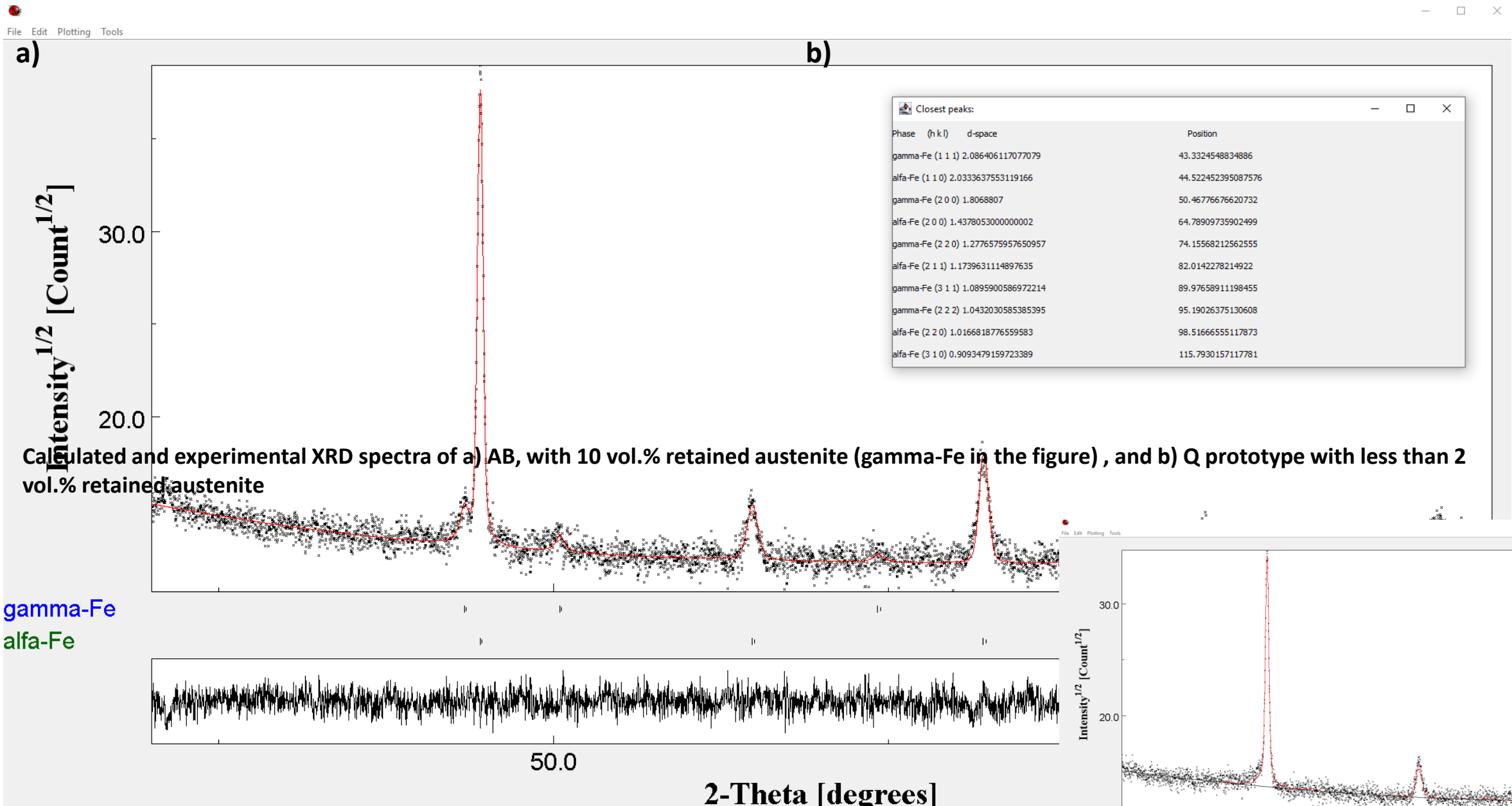


# **General investigations on the heat treatment and thermal fatigue behavior of an experimental hot work tool steel tailored for laser powder bed fusion**

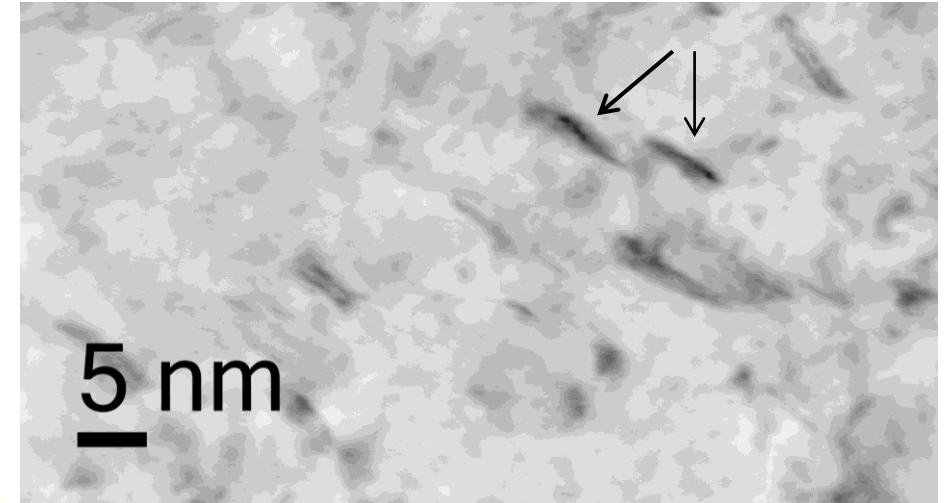
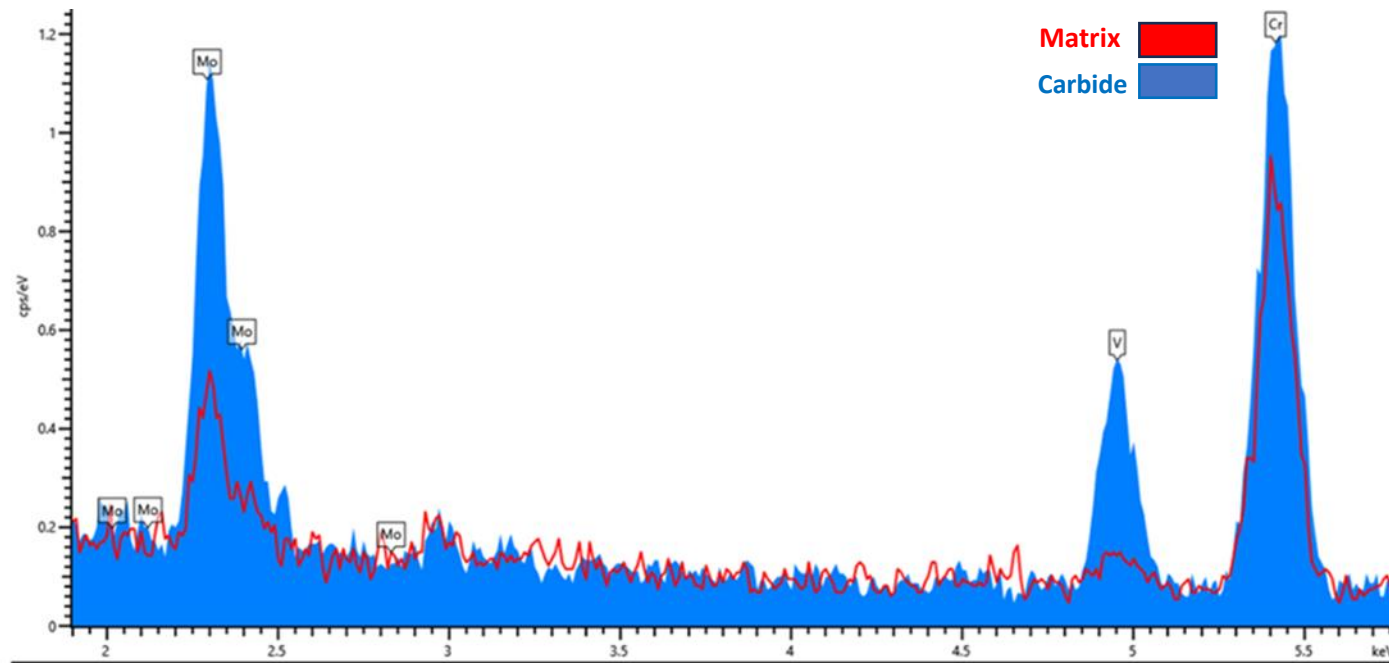
Faraz Deirmina<sup>\*a1</sup>, Lorenzo Quarzago<sup>b1</sup>, Daniel Butcher<sup>c</sup>, Eleonora Bettini<sup>a</sup>, Shahin Mehraban<sup>c</sup>, Jonathan Hann<sup>d</sup>, Niklas Holländer Pettersson<sup>e1</sup>, Nicholas Lavery<sup>c</sup>, Arne Röttger<sup>\*d</sup>, and Massimo Pellizzari<sup>\*b</sup>

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# Supplementary file 1

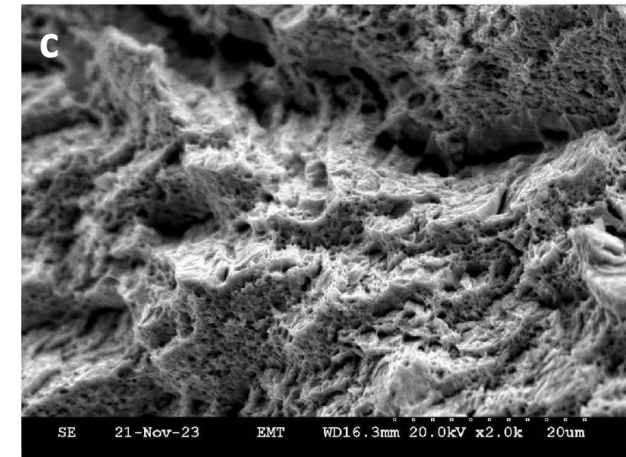
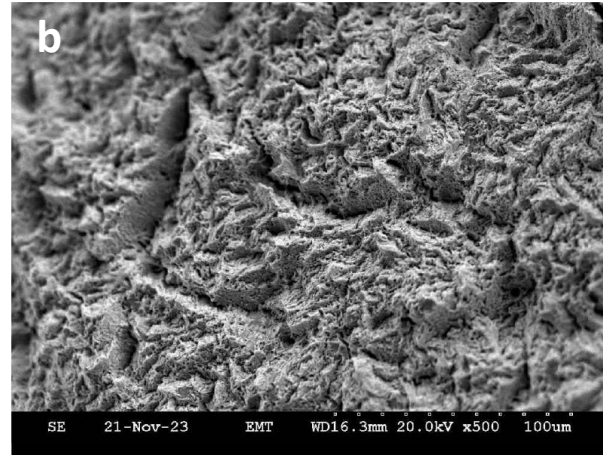
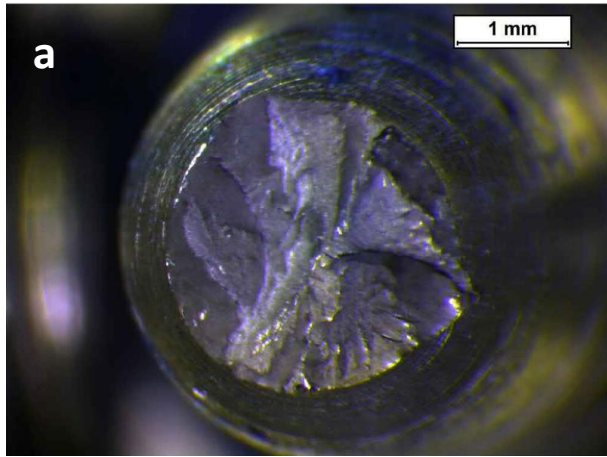


## Supplementary file 2

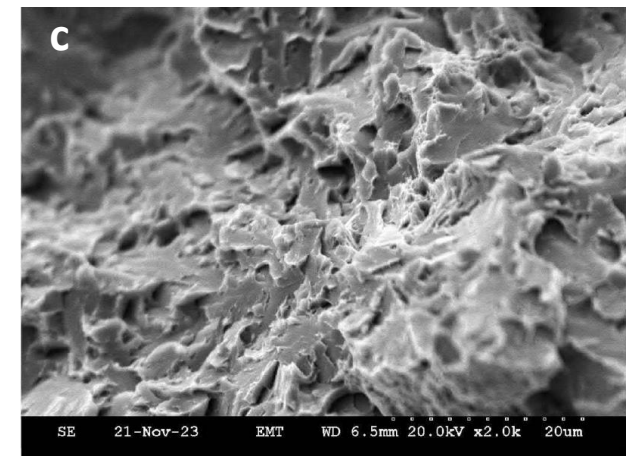
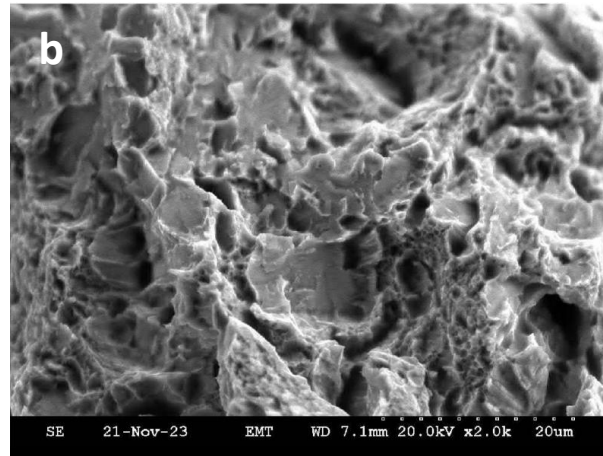
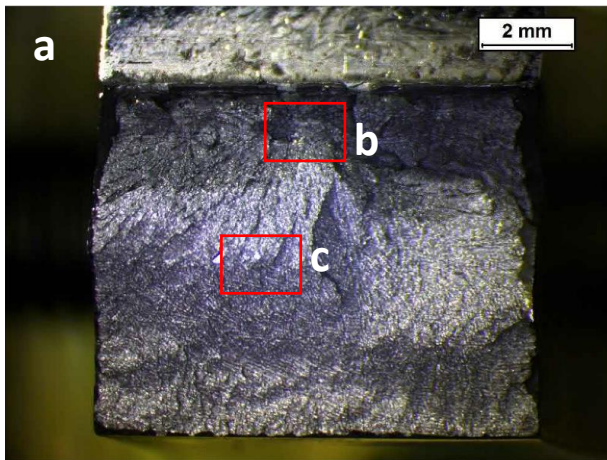


EDS analysis on alloy carbides with enrichment in Mo, V and Cr compared with the matrix

## Supplementary file 3



Stereo image (a), and SEM micrographs of tensile fracture surface of DT prototype at 45 HRC, b) low magnification SEM , and c) higher magnification showing a ductile fracture with presence of dimples



Stereo image (a), and SEM micrographs of impact test fracture surface of DT prototype at 45 HRC, b) crack initiation near notch root showing a quasi-cleavage fracture , and c) crack propagation zone with a quasi-cleavage fracture