

MM 12: Invited talk Pyczak

Time: Monday 15:00–15:30

Location: TC 006

Invited Talk

MM 12.1 Mon 15:00 TC 006

Insights into phase transformations and microstructure development of TiAl alloys by use of advanced characterisation techniques — ●FLORIAN PYCZAK — Helmholtz-Zentrum Geesthacht, Geesthacht, Germany

γ -TiAl alloys, which started out as two phase materials based on the binary Ti-Al phase diagram. Due to the addition of increasing amounts of alloying elements for property optimisation the materials became more and more complex. Frequently not only properties but also the phase constitution is altered. The characterisation of these additional phase constituents with respect to their structure, formation paths, morphology development and integration in the microstructure is an attractive application field for advanced characterisation meth-

ods. High energy X-ray diffraction (HEXRD) at synchrotron sources allows the direct observation of phase transformations at temperature by the use of in-situ specimen environments. This is favourable as the high temperature phase constitution is often masked by subsequent lower temperature phase transformations. Also the transformation of one phase into another can be monitored on a grain by grain basis by these methods. The morphology development of precipitates, even if their size is just some nanometers, can be observed by high resolution electron microscopy picturing the interfaces between these precipitates and the TiAl matrix directly at the atomic scale. Thus, measurements at temperature, with high lateral resolution or by combination of different methods can provide a more complete picture of microstructure changes in the complex microstructures of these TiAl alloys.