



Contribution ID: 56

Type: **Poster**

Microstructure and texture evolutions of γ -TiAl alloy under hot compression via in-situ diffraction

Tuesday, 5 December 2023 14:00 (3 hours)

The third generation β -solidifying TNM alloys with ($\alpha_2+\gamma$) lamellar microstructures have been considered excellent candidates for modern turbine blades due to their low density, high specific strength and stiffness, excellent creep resistance, and good corrosion resistance. It has been proved that orienting the γ lamellae to the direction of the load can significantly increase the mechanical properties of the alloys, thus making lamella orientation control (texturization) an interesting topic for property optimization.

In our work, high temperature compression experiments were performed firstly to intent to texturize the alpha phase through optimization of compressive speed and strains. An optimum basal fiber texture was obtained for alpha phase. Second, the effects of cooling rate, and extern applied load on the process from alpha to gamma transition was studied to successful obtaining the lamellar structure.

Meanwhile, in-situ high-energy synchrotron radiation diffraction experiments were conducted on both the compressing and cooling processes using the unique dilatometer at HEMS, DESY. Diffraction rings analysis for phase transition and microstructure evolution will be presented together with the EBSD investigation in this contribution.

Primary authors: KEITA, Mohamed; Dr GAN, Weimin (Helmholtz-Zentrum Hereon)

Co-authors: SOLIS, Cecilia; Prof. BOUZY, Emmanuel (LEM3, University of Lorraine, Metz, France); Dr MOULIN, Jean-Francois (Hereon); HOFMANN, Michael; Dr ZHANG, Yudong (LEM3, University of Lorraine, Metz, France)

Presenters: KEITA, Mohamed; Dr GAN, Weimin (Helmholtz-Zentrum Hereon)

Session Classification: Poster Session

Track Classification: Material Science