

[PO-F1]Poster Session 1

Symposium F

Mon. Oct 29, 2018 5:45 PM - 8:00 PM Poster Hall

[P1-35]The Influence of Deposition Pattern on Stress and Mechanical Properties in Wire Arc Additive Manufacturing

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Wire arc additive manufacturing (WAAM) has exhibited great advantages of high deposition rate, large fly-to-buy ratio and low cost in aerospace applications. However, the deformation caused by internal stress is still a technical challenge in additive manufacturing, especially during the manufacturing process of the large-scale components. In this work, based on numerical modelling method and physical experiments, by investigating the stress and deformation distribution of Ti6Al4V components deposited by five typical patterns, the preferred deposition pattern will be selected to fabricate components with minimum deformation and uniform stress distribution. The morphology, microstructure and mechanical properties of the components with different deposition patterns were studied as well. The results illustrate that short S-shape pattern is identified as the optimal one which has uniform stress distribution and minimum deformation. The stress distribution of the components with spiral pattern and subarea pattern varies a lot and the reasons have been discussed based on the thermomechanical behavior in WAAM.