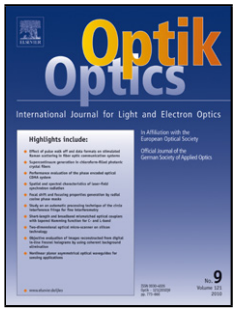

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Numerical analysis of residual stress evolution of AlSi10Mg manufactured by selective laser melting

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Abstract：

In selective laser melting (SLM) process, severe temperature gradients produce large residual stresses, which leading to part distortion and bad performance of alloy products. At present, numerical simulations are widely used to study temperature and residual stress filed within materials, nevertheless, the residual stress prediction of alloys in the way of discontinuous laser scanning is rare to be carried out for SLM manufacturing. This study is aim to establish proper numerical models to investigate residual stress evolution of AlSi10Mg alloy in point exposure SLM process. Firstly, a concept of moving equivalent heat source has been developed to act on powder bed's surfaces to simulate corresponding SLM process. Then, local temperature field within alloy parts