Modelling of the microstructural evolution of Ti6Al4V parts produced by selective laser melting during heat treatment

The microstructure of parts produced by selective laser melting of Ti-6Al-4V is typically martensite in elongated prior β grains, which leads to anisotropic mechanical properties. A heat treatment can reduce this anisotropy by making these grains more equiaxed. In this work, simulations are performed wherein the evolution of the microstructure during a heat treatment is modelled using a cellular automata method. The results obtained from this simulation are compared to experimentally obtained micrographs. The simulated microstructure shows a similar evolution of the prior β grains from columnar to equiaxed, although the average diameter of the grains is slightly smaller in the simulations.