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The Influence of Machine Tool Composite Stiffness to the Surface Waviness When Processing Posture Constantly Switching

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Abstract : Aircraft structures generally have complex surface. Because of constantly switching postures of motion axis, five-axis CNC machine's composite stiffness changes during CNC machining. It gives rise to different amplitude of vibration of processing system, which further leads to the different effects on surface waviness. In order to provide a solution for this problem, we take the "S" shape test specimen's CNC machining for the object, through calculate the five axis CNC machine's composite stiffness and establish vibration model, we analysis of the influence mechanism between vibration amplitude and surface waviness. Through carry out the surface quality measurement experiments, verify the validity and accuracy of the theoretical analysis. This paper's research results provide a theoretical basis for surface waviness control.

Keywords : five axis CNC machine, "S" shape test specimen, composite stiffness, surface waviness
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