Development Of An Automatic Procedure For Machining Distortions Improvement On An Aeronautic Axisymmetric Component

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Abstract. Thin wall components having high buy to fly ratios (from 4 to 10) are widely used in the aeronautical field. They are subjected to high distortions during machining, that can lead to the scrap of the parts or compromise the engine service efficiency. Distortions during machining are due to the redistribution of residual stresses that arise in a component as a consequence its previous thermos-mechanical history. For these reasons, the strict control of machining and the prediction of distortions is an important research issue. In this paper, the authors have developed a procedure to automatically predict the best machining sequence in order to obtain low component distortions. Starting from a pre-loaded (heat treated) axisymmetric component, the automatic procedure is able to perform machining distortions simulations following different material removal sequences; then it is able to detect, among the different possible cutting strategies, the one that improves distortions, caused by the volume removal, over specific geometrical features.