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**A PARAMETRIZATION DESCRIBING BLISK AIRFOIL VARIATIONS  
REFERRING TO MODAL ANALYSIS**

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**ABSTRACT**

*This paper will present a way to capture the geometric blade by blade variations of a milled from solid blisk as well as the manufacturing scatter. Within this idea it is an essential task to digitize the relevant airfoil surface as good as possible to create a valid surface mesh as the base of the upcoming evaluation tasks. Since those huge surface meshes are not easy to handle and are even worse in getting quantified and easy interpretable results, it should be aimed for an easily accessible way of presenting the geometric variation.*

*The presented idea uses a section based airfoil parametrization that is based on an extended NACA-airfoil structure to ensure the capturing of all occurring characteristic geometry variations. This Paper will show how this adapted parametrization method is suitable to outline all the geometric blade by blade variation and even more, refer those airfoil design parameters to modal analysis results such as the natural frequencies of the main mode shapes. This way, the dependencies between the modal and airfoil parameters will be proven.*