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Analysis of Coupled Seals, Secondary and Powerstream Flow Fields in Aircraft and Aerospace Turbomachines

By M. M. Athavale

BiblioGov. Paperback. Book Condition: New. This item is printed on demand. Paperback. 164 pages. Dimensions: 9.7in. x 7.4in. x 0.3in. Higher power, high efficiency gas turbine engines require optimization of the seals and secondary flow systems as well as their impact on the powerstream. This work focuses on two aspects: 1. To apply the present day CFD tools (SCISEAL) to different real-life secondary flow applications from different original equipment manufacturers (OEM s) to provide feedback data and 2. Develop a computational methodology for coupled time-accurate simulation of the powerstream and secondary flow with emphasis on the interaction between the disk-cavity and rim seals flows with the powerstream (SCISEAL-MS-TURBO). One OEM simulation was of the Allison Engine Company T-56 turbine drum cavities including conjugate heat transfer with good agreement with data and provided design feedback information. Another was the GE aspirating seal where the 3-D CFD simulations played a major role in analysis and modification of that seal configuration. The second major objective, development of a coupled flow simulation capability was achieved by using two codes MS-TURBO for the powerstream and SCISEAL for the secondary flows with an interface coupling algorithm. The coupled code was tested against data from three differed configurations:...



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