学术报告

COMPARISON OF THE HARMONIC BALANCE METHOD FOR FLOWS IN FLUID MACHINERY

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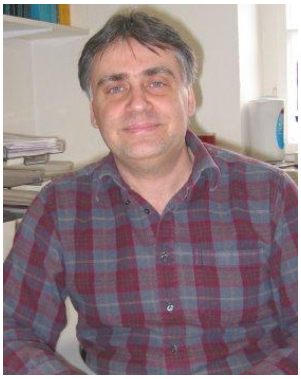

报告时间：2013 年 9 月 16 日 9:30-11:30

报告地点：清华大学热能工程系系馆报告厅

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报告摘要：

A very promising method has been proposed in the last decade from two groups in the US. The method is called Harmonic Balance or Time Spectral method and is very powerful but restrict to periodic flows in ether time or/and space. The method has been mainly applied to flows inside fluid machinery and rotating machinery in general and shows a speedup of the calculation between 5 and 10 compared to unsteady RANS calculations and a speedup around 100 compared to Large Eddy Simulations.

In this presentation we will show how the method performs in predicting the flow around a NACA 0012 aerofoil subject to a pitching motion. The pressure distribution on the surface has been compared with the experimental findings and results from Woodgate/Badcook. The agreement with available experiments appears to be very good. The speedup compared to unsteady calculations with the Dual Time Stepping method is in the order of 10. More advanced three-dimensional calculations will be discussed at the end of the presentation.

报告人简历:

Dr. Franco Magagnato 是卡尔斯鲁厄大学流体机械研究所计算流体动力学研究所的主任。其主要研究方向为开发应用于不同领域（如涡轮机、汽车、航空动力学和内燃机等）中的新的物理模型和数值模型。以 Dr. Franco Magagnato 为主开发的 CFD 程序 SPARC，目前在世界上 10 多个国家的 20 多个科研机构（包括 MIT、加拿大皇家研究院等）得到了应用和开发。