

MATERIALS AND STRUCTURES SYMPOSIUM (C2)  
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COMPUTATIONAL FLUID DYNAMICS ANALYSIS AND FLOW TEST OF MANNED SPACECRAFT

**Abstract**

This paper describes the computational fluid dynamics(CFD) analysis developed and validated using a comprehensive flow test setup during the development of SHENZHOU manned spacecraft in China. Specifically, it aims to build a high fidelity analytical flow model ultimately that can be used for the purpose of cabin air quality assessment, temperature prediction, failure mode analysis, flight operation support and risk mitigation. The process of developing rigorous analytical model is presented and the validity of the model is assessed through a comparison with flow test data. The results show CFD analysis to be of an acceptable accuracy for the flow simulation in spacecraft cabin.