

Employing a Modified Diffuser Momentum Model to Simulate Ventilation of the Orion CEV

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The Ansys CFX CFD modeling tool was used to support the design efforts of the ventilation system for the Orion CEV. CFD modeling was used to establish the flow field within the cabin for several supply configurations. A mesh and turbulence model sensitivity study was performed before the design studies. Results were post-processed for comparison with performance requirements. Most configurations employed straight vaned diffusers to direct and throw the flow. To manage the size of the models, the diffuser vanes were not resolved. Instead, a momentum model was employed to account for the effect of the diffusers. The momentum model was tested against a separate, vane-resolved side study. Results are presented for a single diffuser configuration for a low supply flow case.

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