

## Numerical Simulation Of Gap Flow With Taylor Vortices

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### Numerical Simulation Of Gap Flow

Paolicchi et al used the direct simulation Monte Carlo method to do numerical simulation of two-dimensional steady-state hypersonic rarefied flow in a gap at different width-to-depth ratios and wall temperatures. Yang et al developed a hypersonic aero-thermal simulation method for missile flight.

### Numerical Simulation of Supersonic Gap Flow

Numerical simulation of supersonic gap flow. Jing X(1), Haiming H(1), Guo H(1), Song M(1). Author information: (1)Institute of Engineering Mechanics, Beijing Jiaotong University, Beijing, 100044, China. Various gaps in the surface of the supersonic aircraft have a significant effect on airflows.

### Numerical simulation of supersonic gap flow.

Owing to the compression effect of the subsequent shock wave, the heating ratio at the corner of the windward surface goes up as Mach number increases. 042001-5 Numerical simulation of gap effect in supersonic flow. 2 10 224 16 28 x/mm 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 0 0 15 15 30 15 30 q /q 0 Ma = 2 Ma = 4 2 10 224 16 28 x/mm 8 7 6 5 4 3 2 1 0 1 q /q 0 O A B C (a) (b) O A B C Fig. 5.

### Numerical simulation of gap effect in supersonic flows ...

Numerical Simulation of Supersonic Gap Flow. ... The numerical results reveal that the heat flux ratio is U-shaped distribution on the gap wall and maximum at the windward corner of the gap. The ...

### (PDF) Numerical Simulation of Supersonic Gap Flow

A comparison of the results from the numerical simulations with the experiments in spherical gap flows shows a good agreement concerning the flow structure, bifurcations and existence ranges. Keywords: Spherical gap flow, rotating fluids, bifurcation, non-uniqueness, Taylor vortices 1.

### Numerical Simulations of Spherical Gap Flows

Flow direction Plate stagnation point Pressure far field Pressure far field Gap Angle of attack 2 mm 12 mm O A B C x (a) (b) Fig. 1. Calculation model and gap geometry size. ... 042001-5 Numerical simulation of gap effect in supersonic flows 2 4110 6 222 8 x/mm 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5 0 00 ...

### Numerical simulation of gap effect in supersonic flows

Conclusion Effect of gap height and Mach number on flow field are analyzed by the method of numerical simulation. The following conclusions can be drawn: 1) When the height of shaft gap is lower than the thickness of the boundary layer nearby the shaft gap, the boundary layer is separated in front of the gap entrance, and then reattachment region is formed at the entrance of gap; the separation region is a region of high heat flux.

### High-Resolution Observations and Numerical Simulations of ...

Conclusion Effect of gap height and Mach number on flow field are analyzed by the method of numerical simulation. The following conclusions can be drawn: 1) When the height of shaft gap is lower than the thickness of the boundary layer nearby the shaft gap, the boundary layer is separated in front of the gap entrance, and then reattachment region is formed at the entrance of gap; the separation region is a region of high heat flux.

### Numerical Simulation of Heating Over the Rudder Shaft Gap ...

The theoretical part of this study includes the numerical simulation of the carrier-phase flow through the narrow-gap homogenizer, the results of which are further used for the modelling of the maximum drop size in the final emulsions. For this part of the study, the main results and conclusions can be summarized as follows: •

### Numerical simulation and experimental study of ...

Chang D, S Tavoularis Unsteady numerical simulations of turbulence and coherent structures in axial flow near a narrow gap J. Fluids Eng., 127 (2005), pp. 458-466 Google Scholar

### Numerical simulation of turbulent flow in a channel ...

Numerical computations were carried out at the rudder angle of 3°, as in two-dimensional computations, to confirm the capability of the bars in blocking the gap flow. Numerical computations were performed at cavitation number  $\sigma = (P_{\infty} - P_v) / (0.5 \rho U_{\infty}^2) = 1.0$  and operating pressure and vapor pressure of 20307 Pa, and 2340 Pa respectively.

### A numerical simulation for reduction of rudder cavitation ...

Numerical simulation of gap effect in supersonic flows. Song Mo, 1 Haiming Huang, 1, a) Guo Huang, 1 Xiaoliang Xu, 2 Zimao Zhang 1. 1) ... Convective heating due to gap flow, modeled as fully ...

### (PDF) Numerical simulation of gap effect in supersonic flows

Paolicchi et al [ 8 ] used the direct simulation Monte Carlo method to do numerical simulation of two-dimensional steady-state hypersonic rarefied flow in a gap at different width-to-depth ratios and wall temperatures. Yang et al [ 9 ] developed a hypersonic aero-thermal simulation method for missile flight.

### Numerical simulation of supersonic gap flow. - Abstract ...

Thus, Lagrangian discrete phase model (DPM) has been developed to simulate the gap liquid-solid two-phase flow field. The numerical calculation is based on the standard k-ε turbulent model, and the SIMPLEC algorithm is used in the simulation. All the governing equations are solved by software Fluent 6.2.

### Numerical Simulation of Liquid-Solid Two-Phase Flow Field ...

Recently a numerical simulation of flow field for a whole centrifugal fan, including all three parts—impeller, scroll, and inlet—and considering the gap between the impeller and inlet, has been...

### Numerical Simulation of Flow Field for a Whole Centrifugal ...

Because of large aspect ratio between the height of the gap and the size of pump elements, the authors present the numerical simulation approach using a local model to define a lubrication gap, linked to a global model of a pump from which boundary conditions were imported.

### Gap Flow Simulation Methods in High Pressure Variable ...

The proposed fractional K-BKZ numerical model successfully simulated the characteristics of the viscoelastic material passing through the orifice or the gap of a shock absorber, as demonstrated by accurately capturing the change of the shape of the flow. This fractional K-BKZ numerical model provided better accuracy for the fluid's viscoelasticity and can be used for shock absorber design.

### Fractional K-BKZ Numerical Model of the Start-Up Flow for ...

We study the multiple steady and unsteady flow modes in a medium-gap spherical Couette flow (SCF) by solving the three-dimensional incompressible Navier-Stokes equations. We have used an artificial compressibility method with an implicit line Gauss-Seidel scheme. The simulations are performed in SCF with only the inner sphere rotating. A medium-gap clearance ratio,  $\sigma = R_2/R_1$  ...

### Numerical simulation of multiple steady and unsteady flow ...

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### Numerical simulation of gap flow of sector recess multi ...

Direct numerical simulation (DNS) and large eddy simulation (LES) with a dynamic Smagorinsky subgrid model are performed to investigate the flow past a square cylinder under the influence of ...