Flow Instability In Shock Tube Due To Shock Wave Boundary

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Flow Instability In Shock Tube

Shock' simply refers to inadequate blood flow to the body organs ... Doctors may implant a small mesh tube called a stent as part of PCI to prevent a coronary artery from re-narrowing.

What Is Cardiac Shock?

A woman presented to our hospital with acute abdominal pain 7 months following an oesophagectomy. A chest X-ray revealed a new elevation of the left diaphragm. CT demonstrated a large left ...

Life-threatening presentation of a parahiatal hernia after esophagectomy: a case report and review of the literature

The newborn boy had aortic stenosis (narrow heart valve), a congenital heart condition. While the procedure has been performed on infants before, the condition is 'rare in newborns' since it is mainly ...

Aortic stenosis: Two-day-old baby undergoes operation for heart condition, 'rare' in newborns

He did not expect a return to the inflation levels of the 1970s, but " we have to respect the possibility of a shock to a financial system that has been conditioned and wired for the persistence ...

Wall Street rise continues amid warnings of instability

Haiti's First Lady Martine Moise, 53, suffered multiple gunshot wounds during her husband's assassination in Port-Au-Prince, Haiti, overnight, and was transported to Miami for treatment.

Haiti's first lady flown to Miami for treatment after husband's assassination

Serious malpractice leading to the loss of limbs, paralysis and the deaths of patients wasn't enough for the California Medical Board to stop these bad doctors from continuing to practice medicine.

Botched surgeries and death: How the California Medical Board keeps negligent doctors in business

Three of the most important factors include friction, corrosion and shock. Friction is a factor whenever rotating components meet static

components. In the case of stern tube seals ... pressure ...

Improving seal reliability (sponsored)

Kidney stones can cause a pain greater than that of childbirth. Dehydration is a key factor. And while studies have shown people in hot, humid Southern states are more likely ...

High and dry Colorado ripe for developing kidney stones

Alexandre S. Goy and Jason W. Fleischer, Applied Physics Letters107, 211102 (2015). " A model of anisotropic nonlinearity in self-defocusing photorefractive media " Christopher Barsi and Jason W.

Imaging Physics Group

Can the Specialized Epic EVO Expert prove itself as a formidable all-rounder or will its cross-country DNA hold it back when pushed hard?

Specialized Epic EVO Expert review

In the standard model of structure formation, small overdensities present in the early universe grow via gravitational instability as matter flows from under to overdense regions. Such a potential ...

Discovery of the largest rotation in the universe

A Brazilian military study in the 1930s observed the growing instability in Europe and concluded ... The would serve to protect the increasing flow of merchant shipping both between North and ...

Battle of the South Atlantic: How Brazil Took on Nazi Submarines
When 16-year-old rising volleyball star Deven Gonzalez was pulled from the rubble of her Miami condo building, her initial reaction amid the shock was to tell firefighters that she had to compete ...

Teen, mom fell several floors before rescue in Florida building collapse; dad still missing
Major nations did not permit the free flow of capital internationally because ... However, it was feared that this would lead to economic instability that would ultimately reduce international ...

The Day That Richard Nixon Changed U.S. Economic Policy Forever

Ready for a downcountry bike? They don't get much better than the Revel Ranger - especially if you prioritize fun over watts.

Long Term Review: Revel Ranger is like the Rascal, only smaller (and w/ more tire clearance)

The UAE ' s open economy hinged on tourism and oil encountered attacks from many directions. As the economy recuperates, its priorities over the next few years are expected to change. A year into the ...

What will the UAE economy look like in the next few years?

A two-day-old baby who suffered from a narrow heart valve condition successfully underwent operation at a leading facility here using balloon dilation technique by a minimally invasive procedure,

...

Shock wave-boundary-layer interaction (SBLI) is a fundamental phenomenon in gas dynamics that is observed in many practical situations, ranging from transonic aircraft wings to hypersonic vehicles and engines. SBLIs have the potential to pose serious problems in a flowfield; hence they often prove to be a critical - or even design limiting - issue for many aerospace applications. This is the first book devoted solely to a comprehensive, state-of-the-art explanation of this phenomenon. It includes a description of the basic fluid mechanics of SBLIs plus contributions from leading international experts who share their insight into their physics and the impact they have in practical flow situations. This book is for

practitioners and graduate students in aerodynamics who wish to familiarize themselves with all aspects of SBLI flows. It is a valuable resource for specialists because it compiles experimental, computational and theoretical knowledge in one place.

This proceedings present the results of the 29th International Symposium on Shock Waves (ISSW29) which was held in Madison, Wisconsin, U.S.A., from July 14 to July 19, 2013. It was organized by the Wisconsin Shock Tube Laboratory, which is part of the College of Engineering of the University of Wisconsin-Madison. The ISSW29 focused on the following areas: Blast Waves, Chemically Reactive Flows, Detonation and Combustion, Facilities, Flow Visualization, Hypersonic Flow, Ignition, Impact and Compaction, Industrial Applications, Magnetohydrodynamics,

Medical and Biological Applications, Nozzle Flow, Numerical Methods, Plasmas, Propulsion, Richtmyer-Meshkov Instability, Shock-Boundary Layer Interaction, Shock Propagation and Reflection, Shock Vortex Interaction, Shock Waves in Condensed Matter, Shock Waves in Multiphase Flow, as well as Shock Waves in Rarefield Flow. The two Volumes contain the papers presented at the symposium and serve as a reference for the participants of the ISSW 29 and individuals interested in these fields.

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These proceedings collect the papers presented at the 30th International Symposium on Shock Waves (ISSW30), which was held in Tel-Aviv Israel from July 19 to July 24, 2015. The Symposium was organized by Ortra Ltd. The ISSW30 focused on the state of knowledge of the following areas: Nozzle Flow, Supersonic and Hypersonic Flows with Shocks, Supersonic Jets, Chemical Kinetics, Chemical Reacting Flows, Detonation, Combustion, Ignition, Shock Wave Reflection and Interaction, Shock Wave Interaction with Obstacles, Shock Wave Interaction with Porous Media, Shock Wave Interaction with Granular Media, Shock Wave Interaction with Dusty Media, Plasma, Magnetohyrdrodynamics, Re-entry to Earth Atmosphere, Shock Waves in Rarefied Gases, Shock Waves in Condensed Matter

(Solids and Liquids), Shock Waves in Dense Gases, Shock Wave Focusing, Richtmyer-Meshkov Instability, Shock Boundary Layer Interaction, Multiphase Flow, Blast Waves, Facilities, Flow Visualization, and Numerical Methods. The two volumes serve as a reference for the participants of the ISSW30 and anyone interested in these fields.

Shock wave research covers important inderdisciplinary areas which range from basic topics on gasdynamics, combustion and detonation, physico-chemistry of high temperature gases, plasma physics, astro and geophysics, materials science, astronautics and space technology to medical and industrial applications. This book includes 202 papers presented at the 18th the International Symposium on Shock Waves which describe the research frontier of

shock wave phenopmena and 14 plenary lectures which show the state of the art of various fields of shock wave research. This proceedings is a unique collection of most important and updated shock wave research.

The 26th International Symposium on Shock Waves in G ö ttingen, Germany was jointly organised by the German Aerospace Centre DLR and the French-German Research Institute of Saint Louis ISL. The year 2007 marked the 50th anniversary of the Symposium, which first took place in 1957 in Boston and has since become an internationally acclaimed series of meetings for the wider Shock Wave Community. The ISSW26 focused on the following areas: Shock Propagation and Reflection, Detonation and Combustion, Hypersonic Flow, Shock Boundary Layer Interaction,

Numerical Methods, Medical, Biological and Industrial Applications, Richtmyer Meshkov Instability, Blast Waves, Chemically Reacting Flows, Diagnostics, Facilities, Flow Visualisation, Ignition, Impact and Compaction, Multiphase Flow, Nozzles Flows, Plasmas and Propulsion. The two Volumes contain the papers presented at the symposium and serve as a reference for the participants of the ISSW 26 and individuals interested in these fields.

Proceedings from a symposium on shock tubes and waves held July 6-9, 1981.

The Extreme Fluids Team in P-23, Physics Division, studies fluid dynamics at high speeds using high resolution diagnostics. The

unsteady forces on a particle driven by a shock wave are not well understood, and they are difficult to model. A horizontal shock tube (HST) is being modified to collect data about the behavior of particles accelerated by shocks. The HST has been used previously for studies of Richtmyer-Meshkov instability using Planar Laser-Induced Fluorescence (PLIF) as well as Particle Image Velocimetry (PIV), diagnostics that measure density and velocity. The purpose of our project is to design a flow system that will introduce particles into the HST. The requirements for this particle flow system (PFS) are that it be non-intrusive, be able to introduce either solid or liquid particles, have an exhaust capability, not interfere with existing diagnostics, and couple with the existing HST components. In addition, the particles must flow through the tube in a uniform way. We met these design criteria by first drawing the existing shock

tube and diagnostics and doing an initial design of the ducts for the PFS. We then estimated the losses through the particle flow system from friction and researched possible fans that could be used to drive the particles. Finally, the most challenging component of the design was the coupling to the HST. If we used large inlets, the shock would lose strength as it passed by the inlet, so we designed a novel coupling inlet and outlet that minimize the losses to the shock wave. Our design was reviewed by the Extreme Fluids Team, and it is now being manufactured and built based upon our technical drawings.

This thesis was motivated by the need to better understand the temperature distribution in shock tube flows, especially in the near-wall flow regions. Two main ideas in planar laser-induced

fluorescence (PLIF) diagnostics are explored in this thesis. The first topic is the development of a single-shot PLIF diagnostic technique for quantitative temperature distribution measurement in shock tube flow fields. PLIF is a non-intrusive, laser-based diagnostic technique capable of instantaneously imaging key flow features, such as temperature, pressure, density, and species concentration, by measuring fluorescence signal intensity from laser-excited tracer species. This study performed a comprehensive comparison of florescence tracers and excitation wavelengths to determine the optimal combination for PLIF imaging in shock tube flow applications. Excitation of toluene at 248nm wavelength was determined to be the optimal strategy due to the resulting high temperature sensitivity and fluorescence signal level, compared to other ketone and aromatic tracers at other excitation wavelengths.

Sub-atmospheric toluene fluorescence yield data was measured to augment the existing photophysical data necessary for this diagnostic technique. In addition, a new imaging test section was built to allow PLIF imaging in all regions of the shock tube test section, including immediately adjacent to the side and end walls. The signal-to-noise (SNR) and spatial resolution of the PLIF images were optimized using statistical analysis. Temperature field measurements were made with the PLIF diagnostic technique across normal incident and reflected shocks in the shock tube core flow. The resulting images show uniform spatial distribution, and good agreement with conditions calculated from the normal shock jump equations. Temperature measurement uncertainty is about 3.6% at 800K. The diagnostic was also applied to image flow over a wedge. The resulting images capture all the flow features predicted

by numerical simulations. The second topic is the development of a quantitative near-wall diagnostic using tracer-based PLIF imaging. Side wall thermal boundary layers and end wall thermal layers are imaged to study the temperature distribution present under constant pressure conditions. The diagnostic technique validated in the shock tube core flow region was further optimized to improve near-wall image quality. The optimization process considered various wall materials, laser sheet orientations, camera collection angles, and optical components to find the configuration that provides the best images. The resulting images have increased resolution (15[Mu]m) and are able to resolve very thin non-uniform near-wall temperature layers (down to 60[Mu]m from the surface). The temperature field and thickness measurements of near-wall shock tube flows under various shock conditions and test gases showed good agreement

with boundary layer theory. To conclude this thesis, new applications and future improvements to the developed PLIF diagnostic technique are discussed. These suggested refinements can provide an even more robust and versatile PLIF imaging technique capable of measuring a wider range of flow conditions near walls.