

EAU Research Office
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EAU Virtual Research Seminar 2: Wednesday 14th April 2021

Wednesday 14 April: 0950-11:50	
09:50-10:00 Joining & Welcome	EAU Research Centre
10:10-10:50 Presenter: Dr. Abdalellah Mohmmmed	Title: <i>One-way coupled fluid–structure interaction of gas–liquid slug flow in a horizontal pipe: Experiments and simulations</i>
11:00-11:40 Presenter: Dr Reyaz Ahmad	Title: <i>Some Classes of Opertors Related To p-Hyponormal Opertor</i>
End of Seminar: 11:50	

Upcoming Seminar:

EAU Virtual Research Seminar 3: TBA

EAU Virtual Research Seminar 2: Abstracts

One-way coupled fluid–structure interaction of gas–liquid slug flow in a horizontal pipe: Experiments and simulations

Dr Abdalellah Mohmmed

School of Engineering, Emirates Aviation University

Pipelines conveying a multiphase mixture must withstand the cyclic induced stresses that occur due to the alternating motion of gas pockets and liquid slugs. Few previous studies have considered gas–liquid slug flow and the associated fluid–structure interaction problems. In this study, experimental and numerical techniques were adopted to simulate and analyze the two-phase slug flow and the associated stresses in the pipe structure. In the numerical simulation, a one-way coupled fluid–structure framework was developed to explore the slug flow interaction with a horizontal pipe assembly under various superficial gas and liquid velocities. A modified Volume of Fluid and finite element methods were utilized to model the fluid and structure domains. The file-based coupling technique was adopted to execute the coupling mechanism. By contrast, slug characteristics were measured experimentally, while Bi-axial strain gauges were used to capture time-varying strain signals. Excellent agreements between the predicted and measured stress results were achieved with a maximum error of 10.2 %. It was found that at constant superficial liquid velocity, the maximum induced stresses on the pipe wall increased with increasing the slug length and slug velocity. While for the slug frequency, the maximum principal stresses decreased with increasing the slug frequency.

Some Classes of Opertors Related To p -Hyponormal Opertor

Dr Reyaz Ahmad

School of Mathematics, Statistics and Computing, Emirates Aviation University

We introduced a new family of classes of operators termed as $*p$ -*paranormal* operator, $*A(p,p); p > 0$ and $*A(p,q); p, q > 0$, parallel to p -*pranormal* operator and classes $A(p,p); p > 0$ and $A(p,q); p, q > 0$ introduced by M.Fuji, D. jung, S.H.Lee and R. Nakamoto [1]. We present a necessary and sufficient condition for p -hyponormal operator $T \in B(H)$ to be $*p$ -*paaranormal* and the *monotonicity* of $*A(p,q)$. We also present an alternative proof of a result of M.Fuji, et.al. [Theorem 3,4]