# Article information:

Prediction of interfacial shear stress of vertical upward adiabatic annular flow in pipes - ScienceDirect  
<https://www.sciencedirect.com/science/article/pii/S0017931018333027>

# Article summary:

1. Annular flow is a common two-phase gas-liquid flow observed in many industrial applications.

2. Interfacial shear stress is an important force acting on the liquid-gas interface and accurately modeling it can improve prediction of momentum equation significantly.

3. A review of existing interfacial friction factor correlations or models has been conducted, and a new correlation based on non-dimensional numbers representing flow conditions and fluid properties for vertical upward co-current air-water annular two-phase has been developed.

# Article rating:

Appears moderately imbalanced: The article provides some useful information, but is missing several important points or pieces of evidence that would be required to present the discussed topics in a balanced and reliable way. You are encouraged to seek a more balanced perspective on the presented issues by exploring the provided research topics and looking at different information sources.

# Article analysis:

The article titled "Prediction of interfacial shear stress of vertical upward adiabatic annular flow in pipes" provides an overview of the interfacial friction factor and its correlation with the interfacial shear stress in annular two-phase flow. The article highlights the importance of accurately modeling the interfacial shear stress to improve the prediction of momentum equation and numerical simulation of annular flow.

The article presents a review of existing work on interfacial friction factor, including Wallis's correlation, which correlates the interfacial friction factor with film thickness based on sand-grain roughness analogy. The article also discusses modifications made to Wallis's correlation by other researchers, such as considering liquid entrainment and gas Reynolds number dependence.

However, the article has some potential biases and missing points of consideration. Firstly, it only focuses on vertical upward adiabatic annular flow in pipes, which limits its applicability to other types of two-phase flows. Secondly, it does not provide a comprehensive analysis of all available databases with reasonable uncertainties but only uses some datasets for developing a new correlation.

Moreover, the article does not explore counterarguments or limitations to existing correlations and their applicability to different flow conditions and fluid properties. It also lacks evidence for claims made about the convenience of using non-dimensional numbers instead of film thickness for modeling interfacial friction factor.

Additionally, there is no discussion about possible risks associated with inaccurate prediction of two-phase flow characteristics in industrial applications or how improved modeling can mitigate these risks. The article also does not present both sides equally as it only focuses on developing a new correlation without discussing potential drawbacks or limitations.

In conclusion, while the article provides useful insights into modeling interfacial shear stress in annular two-phase flow, it has some biases and missing points that limit its overall effectiveness. Further research is needed to address these limitations and provide a more comprehensive understanding of this important topic.

# Topics for further research:

* Limitations of existing correlations for interfacial friction factor in two-phase flow
* Applicability of interfacial shear stress modeling to different types of two-phase flow
* Risks associated with inaccurate prediction of two-phase flow characteristics in industrial applications
* Counterarguments to sand-grain roughness analogy for interfacial friction factor
* Importance of fluid properties in modeling interfacial shear stress
* Comparison of different non-dimensional numbers for modeling interfacial friction factor

# Report location:

<https://www.fullpicture.app/item/0859d4e346dc33835bf832cd66609b23>