# Article information:

An optimize empirical correlations for liquid film thickness and interfacial friction factor in vertical gas-liquid annular flow - ScienceDirect
<https://www.sciencedirect.com/science/article/abs/pii/S1876107023000378>

# Article summary:

1. Optimized empirical correlations for liquid film thickness and interfacial friction factor in vertical gas-liquid annular flow have been presented.

2. The liquid film thickness is provided as a novel five-variable correlation function of gas phase superficial velocity, liquid phase velocity, pipe diameter, Weber number, and Froude number, with an R2 value of 0.98.

3. For the thickness of the liquid film and the interfacial friction coefficient, the experimental values and suggested correlations deviate by a maximum of 3.15 percent and 4.56 percent, respectively.

# Article rating:

May be slightly imbalanced: The article presents the information in a generally reliable way, but there are minor points of consideration that could be explored further or claims that are not fully backed by appropriate evidence. Some perspectives may also be omitted, and you are encouraged to use the research topics section to explore the topic further.

# Article analysis:

The article titled "An optimized empirical correlations for liquid film thickness and interfacial friction factor in vertical gas-liquid annular flow" presents a study on the annular flow regime, which is one of the most prevalent two-phase flow regimes. The study aims to provide optimized empirical correlations for liquid film thickness and interfacial friction factor in vertical gas-liquid annular flow.

The article provides a detailed description of the experimental setup used to generate an annular flow pattern in a counter-current two-phase flow in a vertical transparent pipe. The range of air and water velocities for annular flow was also provided. The authors then present their findings, which include a novel five-variable correlation function for liquid film thickness and a five-variable correlation for interfacial friction factor.

The article's strengths lie in its detailed description of the experimental setup and methodology used to generate the results. The authors also provide sensitivity analysis of their findings, which reveals that the liquid film thickness and interfacial friction factor are most sensitive to changes in superficial velocity of the gas phase and Reynolds number of the liquid phase, respectively.

However, there are some potential biases and limitations to consider. Firstly, the study only focuses on vertical gas-liquid annular flow, limiting its generalizability to other types of flows. Secondly, while the authors claim that their suggested correlations have high coefficients of determination (R2), they do not provide any evidence or explanation as to why these correlations are better than existing ones.

Additionally, there is no discussion or exploration of potential counterarguments or limitations to their findings. For example, it is unclear how variations in pipe diameter or fluid properties may affect their suggested correlations.

Overall, while this article provides valuable insights into optimizing empirical correlations for liquid film thickness and interfacial friction factor in vertical gas-liquid annular flow, it would benefit from further discussion and exploration of potential biases and limitations.

# Topics for further research:

* Limitations of empirical correlations in two-phase flow regimes
* Sensitivity analysis of liquid film thickness and interfacial friction factor in annular flow
* Effects of pipe diameter on annular flow patterns
* Comparison of existing correlations for liquid film thickness and interfacial friction factor
* Influence of fluid properties on annular flow behavior
* Generalizability of empirical correlations to other types of two-phase flow regimes

# Report location:

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