# Article information:

New dimensionless number for gas–liquid flow in pipes - ScienceDirect  
<https://www.sciencedirect.com/science/article/abs/pii/S0301932215300835>

# Article summary:

1. A Slippage Number (SL) has been proposed as a dimensionless number for gas-liquid flow in pipes, which correlates holdup data with mixture velocity Froude number in a self-similar behavior regardless of operational conditions, pipe diameter, viscosities, and inclination angle.

2. The SL decreases exponentially with increasing the Froude number based on mixture velocity (FrM) of the two phases and can be used to some extent as a flow pattern identifier.

3. The SL was evaluated using data from nine different experimental datasets covering a wide range of fluid properties, pipe diameter, inclination angles, and operational conditions with different flow patterns.

# 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 discusses a new dimensionless number called the Slippage Number (SL) for gas-liquid flow in pipes. The article provides a detailed discussion of currently available relevant dimensionless numbers and compares them with the proposed SL. The article presents experimental data to validate the proposed relation between SL and FrM, which is defined as the mixture Froude number.

The article provides a critical review of SL vs. FrM and presents two arguments about this number. However, one argument is not valid because it assumes that the x-axis becomes just vSG when vSG is dominating, which is not true for the data presented in Fig. 1.

The article evaluates the SL vs. FrM behavior for different studies sorted by flow pattern and suggests that SL decreases with FrM, and its values are highest for bubble and elongated bubble flow patterns and lowest for low liquid holdup annular flow patterns.

The article concludes that SL correlates holdup data with mixture velocity Froude number in a self-similar behavior regardless of operational conditions, pipe diameter, viscosities, and inclination angle. However, the article does not discuss potential biases or sources of bias in the study or provide evidence to support its claims fully.

Overall, while the article provides valuable insights into a new dimensionless number for gas-liquid flow in pipes, it could benefit from more thorough analysis of potential biases or limitations in the study and more robust evidence to support its claims fully.

# Topics for further research:

* Limitations of Slippage Number in gas-liquid flow analysis
* Comparison of Slippage Number with other dimensionless numbers
* Effect of pipe diameter and inclination angle on Slippage Number
* Sources of bias in Slippage Number experimental data
* Validity of Slippage Number for different flow patterns
* Applications of Slippage Number in gas-liquid flow measurement and control

# Report location:

<https://www.fullpicture.app/item/c20e270e87a8890c4a55bc8d8b90654b>