

Many gas-liquid flows show properties and behaviors very far from air/water flows (e.g. high viscous oil/air flows in pipelines or magmas rising in volcanoes conduits) but research has been carried out mainly with air/water mixtures. Thus, theories and models have been developed starting from that particular system and, probably, this has affected the results, which do not always take into account mechanisms and parameters that would be relevant for other systems.

The aim of my investigation is to better comprehend the effect of viscosity on two-phase flows and on the mechanics of large bubbles in pipes in order to adapt existing theories or develop new ones.

The investigation is conducted both experimentally and theoretically.

The expected results are the development of new theoretical correlations and models useful for predicting operative conditions in pipelines and wells.