Analysis of different cavitation models in a laminar flow. AN-
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Trieste — We compare the performance of different cavitation models in terms of
vaporization and condensation rates for the correct simulation of the process. We
compare homogeneous mixture models, that study the cavitation through the vapor
fraction solving its transport equation and defining the formulations for the source
terms. We consider 4 models: Kunz, Merkle, Schnerr-Sauer, and Saito, and evaluate
their performance in the case of laminar flow around a circular cylinder at $Re=200$,
already analyzed by [Gnanaskandan, Mahesh, JFM 2016]; The numerical tests are
carried out adopting the interPhaseChangeFoam solver and cavitation models al-
ready present in the OpenFOAM library. The Saito model was implemented by
scratch. We analyze some fundamental aspects of the cavitating flow, such as the
pressure distribution over the body surface, vortex shedding frequency, the length
of the attached cavity downstream the body, and the time oscillations of the entire
cavity volume. The results are found to be strongly dependent on the cavitation
model adopted and on the magnitude of the empirical parameters contained in the
cavitation models, namely the vaporization and condensation coefficients.

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