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A comparative study of cavitation models in a Venturi flow

Boris Charrière[a], Jean Decaix[b], Eric Goncalvès[a,*]

[a] *LEGI - University of Grenoble, 1025 rue de la Piscine, 38400 St Martin d'Heres, France*
[b] *University of Applied Sciences, Western Switzerland, CH-1950 Sion*

Abstract

This paper presents a numerical study of an aperiodic cavitation pocket developing in a Venturi flow. The mass transfer between phases is driven by a void ratio transport equation model. A new free-parameter closure relation is proposed and compared with other formulations. The re-entrant jet development, void ratio profiles and pressure fluctuations are analyzed to discern results accuracy. Comparisons with available experimental data are done and good agreement is achieved.

Keywords: Cavitation, Mass transfer, Homogeneous model, RANS simulation

Nomenclature

c	speed of sound
C_p, C_v	thermal capacities
E	total energy
e	internal energy

*Corresponding author
Email address: eric.goncalves@legi.grenoble-inp.fr (Eric Goncalvès)