Measurement and Interpretation of Cavitation Noise in a Hybrid Hydrodynamic Cavitating Device

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Abstract

In the recent past, a number of new methods of utilizing hydrodynamic cavitation to create more intense and energy efficient liquid processes have came into existence. It is, however, technically challenging to characterize these processes either quantitatively, or qualitatively. In this present work a hybrid device producing more energy intensive cavitation has been described which has a blade positioned in the back pressure zone (downstream side of the orifice plate). This method of cavitation production route has been quantitatively described in the form of hydrophone measured pressure signals. FFT analysis has been applied to the signal obtained at various positions of the blade, and at different inlet and outlet (back) pressures. Qualitative analysis in terms of cavity size distribution and the total number of cavitational bubbles has been conducted, using a slightly modified technique of inverse FFT reconstruction procedure originally developed by Avvaru and Pandit[1] to model cavity size distribution.

keywords: cavitation, bubble size distribution, Acoustic emission spectra, inverse FFT reconstruction, resonating blade

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