

A. VOSKOBOINICK¹, A. REDAELLI², V. VOSKOBOINICK¹,
G. B. FIORE², I. NESTERUK¹, R. VISMARA², F. LUCHERINI²

Hydroacoustics of the prosthetic bileaflet mitral valve

¹*Institute of Hydromechanics of NAS Ukraine, Kyiv, Ukraine*

²*Politecnico di Milano, Milan, Italy*

E-mail: alexandr.vsk@gmail.com

The report presents the research results of jet flow noise of the open and semi-closed bileaflet mitral valve. The studies were conducted in microlaboratory of the Polytechnic Institute of Milan. Hydrodynamic noise was measured by the miniature absolute pressure and pressure fluctuation sensors inside the test bench with the prosthetic bileaflet mitral valve. Hydroacoustics central and side jets that flowed from open and semi-closed mitral valve was studied for four water discharge from the 5L/min to 20l/min. The changes integral and spectral characteristics of the field of pressure fluctuations, depending on the flow regime and the condition of the mitral valve are detected. It was found that for a constant water flow conditions inside the atrium (20 l/min), hydrodynamic noise inside the bench is increased nearly 5 times in the frequency range (55-65) Hz and nearly 2 times in the frequency range (10-150) Hz when the semi-closed valve. Experimental researches have shown that the valve flow noise measurements can be an effective diagnostic tool of the artificial bileaflet mitral valve operation.