

1125-76-2278

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Wave intensity analyses (WIA) are widely used to study pressure and flow propagation in the cardiovascular system, which is a complex and nonlinear, with many vessels and bifurcations from which waves are reflected. The method separates the forward and backward components of waves in order to understand and characterize the pulsatile behaviour, and the work done by the heart. In this study, arterial wave propagation is simulated numerically in a computational model [1] that couples three-dimensional finite-strain structure-based left ventricle (LV) with a one-dimensional mathematical model of the systemic arteries (SA). The aim is to use WIA to predict peak pressures and the load on the LV arising from pathologies of the cardiovascular system and to identify biomarkers for different diseases.

[1] Chen, W.W., Gao, H., Luo, X.Y., and Hill, N.A. (2016) Study of cardiovascular function using a coupled left ventricle and systemic circulation model. *Journal of Biomechanics* (Received September 20, 2016)