Università degli Studi di Pavia

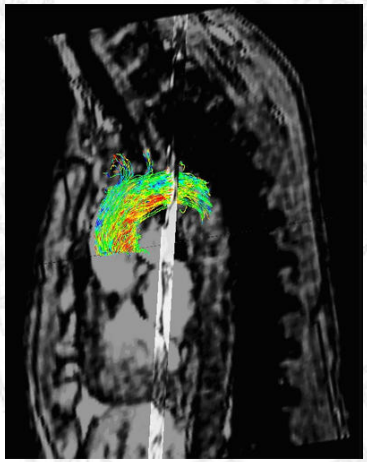
Dipartimento di Meccanica Strutturale

in collaboration with
Centro di Simulazione Numerica Avanzata – CeSNA
Istituto Universitario di Studi Superiori

SEMINAR

Visualization and Quantification of Blood Flow in the Human Aorta. from in vivo 4D Phase Contrast MRI to Subject-Specific Computational Hemodynamics

The complex hemodynamics observed in the human aorta is partially due to complicated geometry of the thoracic aorta, where laminar-turbulent transitional flows are present. There is substantial evidence that aortic segments that appear to be exposed to abnormal flow are more prone to the onset and development of vascular pathology. By coupling medical imaging and computational fluid dynamics (CFD) it is possible to computationally reconstruct the time-varying blood flow patterns in anatomically realistic model, thus obtaining the wall shear-stress distribution. Recently, PC-MRI has emerged as an effective tool for providing non-invasively and concurrently accurate vascular geometries for CFD simulations and quantitative data on blood flow rates. We present our findings about the influence of assumptions regarding the velocity profile at the inlet section of ascending aorta, incorporating the 4D PC MRI measured velocity profiles within the computational models.



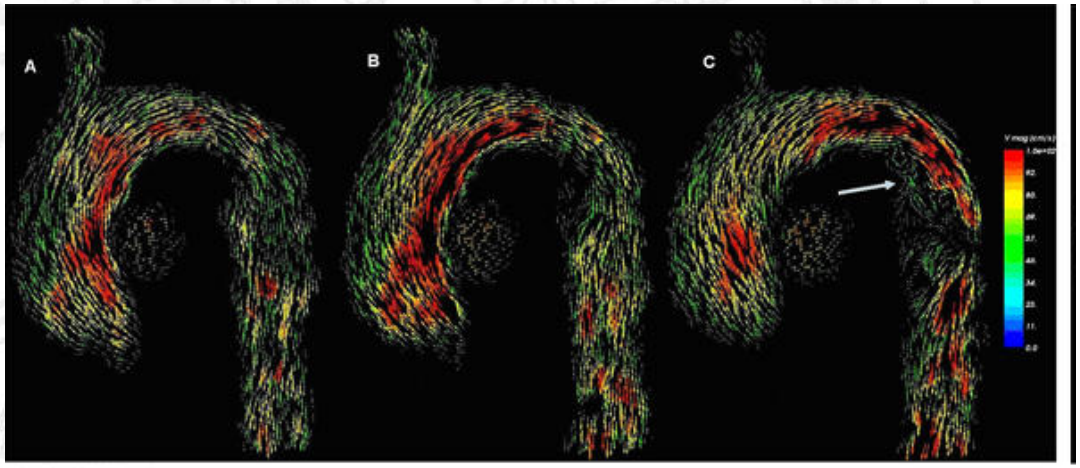


Figure 3 Morbiducci et al.

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Thursday May 5
Aula MS1, 12.00 – 13.00
Dip. Mecc. Strutt.