

Preprocessing of time-resolved PC-MRI data

Phase contrast (PC) MRI has been widely used for the analysis of blood flow and tissue motion [1-3]. However, several sources of error exist:

- eddy-currents
- velocity aliasing
- noise
- acceleration effects etc.

and should be corrected before further data processing.

For such pre-processing of velocity encoded PC-MRI data a customized software package was developed using Matlab (The Mathworks, Inc.). The tool provides several noise-masking functions, correction of eddy-currents as well as phase unwrapping algorithms.

The figure below shows images of ascending (AAo) and descending (DAo) aorta. The anatomy is represented by magnitude images (upper row) and blood flow velocity by phase images (middle row). In the bottom row, phase images after pre-processing are shown. This modified data exhibit reduced noise and initially aliased blood flow velocities were successfully corrected.

[1] Pelc et al. Magn Reson Q 1991; 4: 229-254.

[2] Nayler GL, et al. J Comput Assist Tomogr 1986; 10:715-22.

[3] Markl M, Draney et al. J Comput Assist Tomogr 2004;28:459-468.