

## BLOOD UNDER MAGNETS

#CPGposterCompetition

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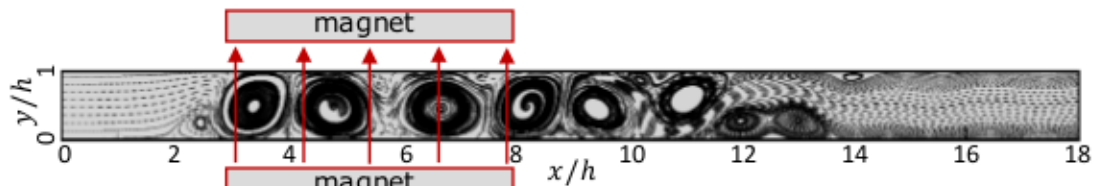


Fig 1: Frozen-in-space vortices caused by blood magnetisation.

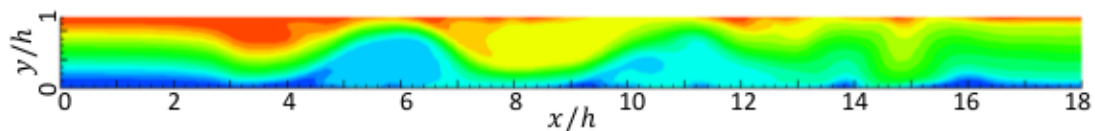


Fig 2: Thermal mixing in blood flow at strong magnetic fields.

### Interaction of blood flow with magnetic fields

The interaction of blood flows with magnetic fields may sound something out of the ordinary for a researcher to investigate. However, this phenomenon is encountered in our daily lives, for instance, when you take an MRI scan or during astronauts' re-entry process experiencing Earth's strong magnetic field.

Under the presence of magnetic fields, blood, a biomagnetic fluid, is magnetised, due to its high Haemoglobin content. In turn, this causes blood to form vortical type of flow behaviour, as shown in figure 1. These vortices do not propagate with the flow but rather are magnetically frozen in space, or in lay words, 'pinned' in place. It is remarkable that under magnetic fields of significant strength blood is perturbed even at low speeds such that it resembles turbulent flow! This is an active field of research referred to as magnetohydrodynamic (MHD) turbulence.

This research was conducted at Cranfield University as part of my M.Sc. in Computational Fluid Dynamics thesis under the kind supervision of Dr. László Könözsy.

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