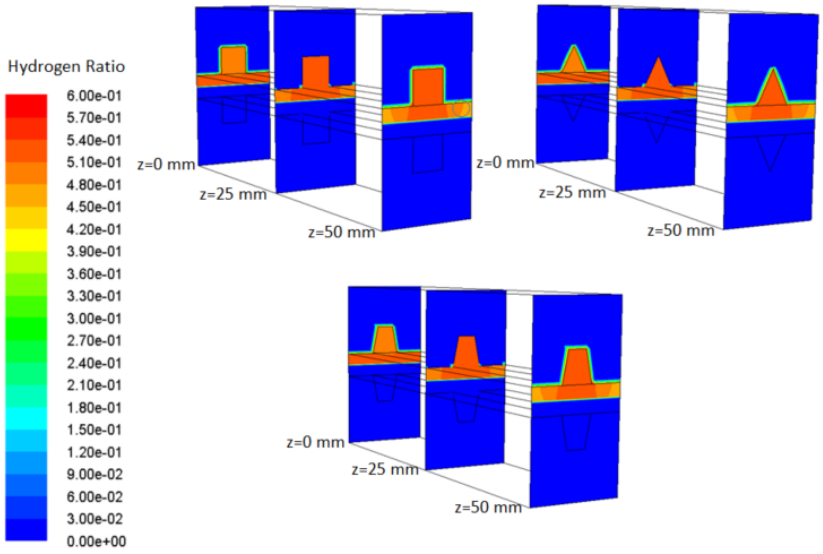

Fig. 9. The distribution of velocity in the z = 0, z = 25 and z = 50 mm planes.

IV. Conclusion

To examine the performances of fuel cells with rectangular, triangular and trapezoidal channel geometries, steady state, single-phase, the three-dimensional and non-isothermal model developed. The cell width, the channel width and the channel height were kept constant when the analyses were made.

The results of the study were summarized below in terms of the items.

- The cell potential is increased by increasing the current density.
- Electrical power increases with increasing cell potential, but decreases after cell potential maximum value passes.
- The maximum flow density occurs at the corner points of the gas diffusion plate and flow channel.
- Towards the outlet section in the anode gas channel, the hydrogen ratio and the fluid velocity decrease.
- As can be seen, the effect of the channel cross-section geometry is not evident at low current densities.
- In fuel cells with square and trapezoidal channel structures, close results were obtained, on the other hand, geometry with triangular channel structure yielded higher cell potential and power values.

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