Computational benchmark #1 (Nozzle)

For the first study, a bidirectional nozzle model was created in which the flow diameter changed either suddenly or gradually. Particle image velocimetry measurements were acquired in three laboratories using a Newtonian blood analog fluid which matched the refractive index of the nozzle models. The flow rate was adjusted so that the velocity field and pressure along the model could be measured at Reynolds numbers in the nozzle throat which corresponded to laminar (Re = 500), transitional (Re = 2000), and turbulent flow regimes (Re = 3500, 5000, 6500).

Details about geometry, flow conditions, experimental dataset, publications from the working group, acknowledgements, and citations using the benchmarks are provided in the links below:

- **Instructions**: Instructions about the geometry files (Figure 1) and flow conditions (Table 1) and CAD files can be downloaded here: [https://link.springer.com/article/10.1007/s13239-012-0087-5](https://link.springer.com/article/10.1007/s13239-012-0087-5).
- **Data**
- **Publications**
- **Acknowledgements**
- **Citations using the benchmarks**: Others are building on this work. Here is a list of references by others using the Nozzle Model (that we are aware of as of 12-31-2021). If you have published or presented a study using this model (or know of one not listed below) please let us know.