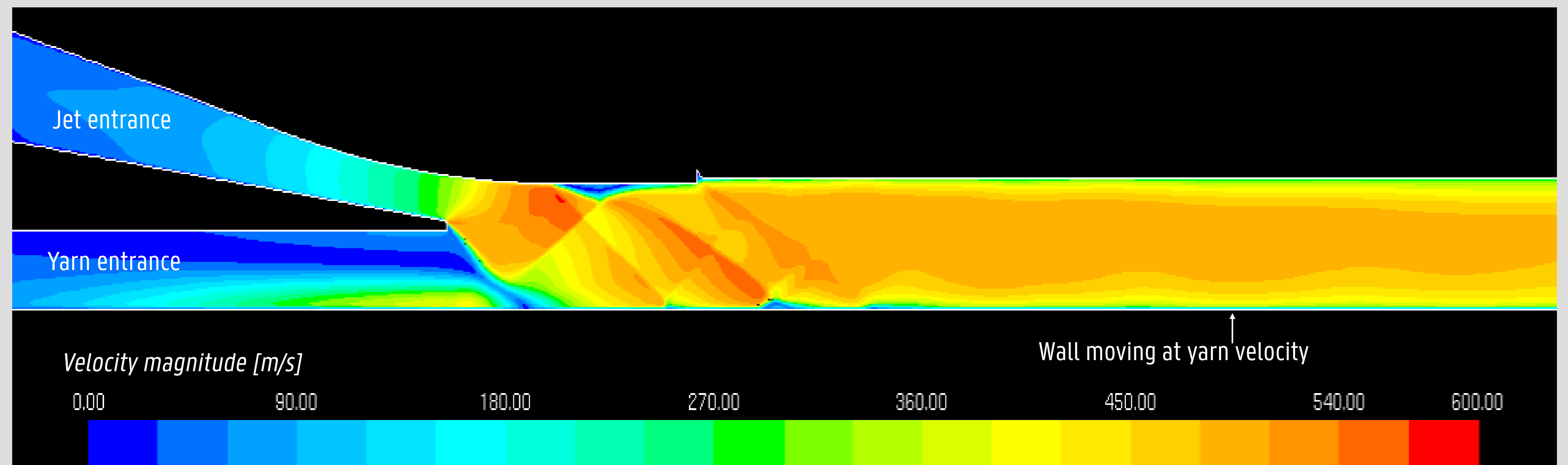


TOWARDS FAST COMPUTATION OF A SMOOTH YARN'S VELOCITY IN AIR JET WEAVING LOOMS

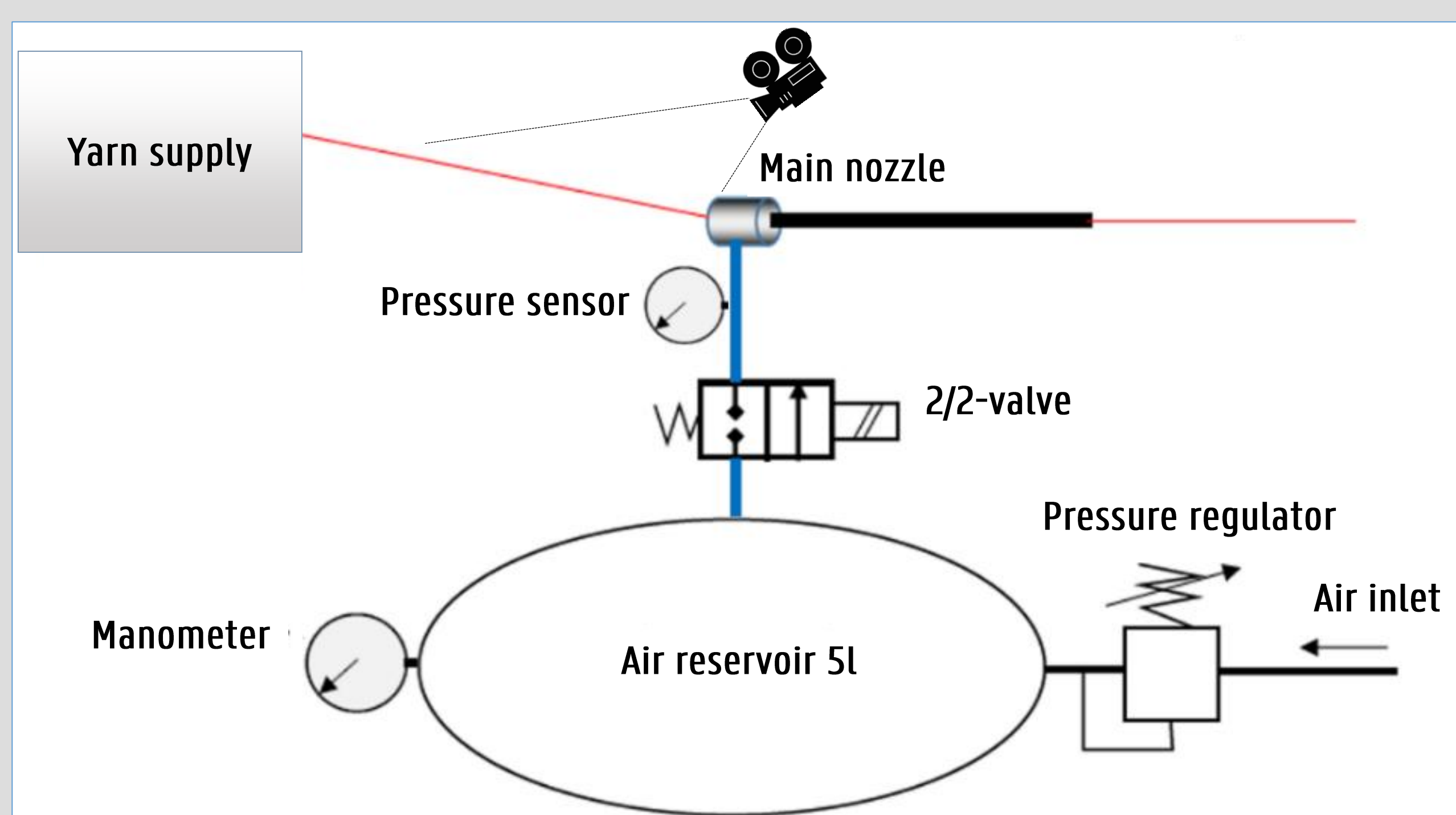
Optimization of main nozzle in air jet weaving looms

Complex flow patterns
↓
Influence of geometrical changes?

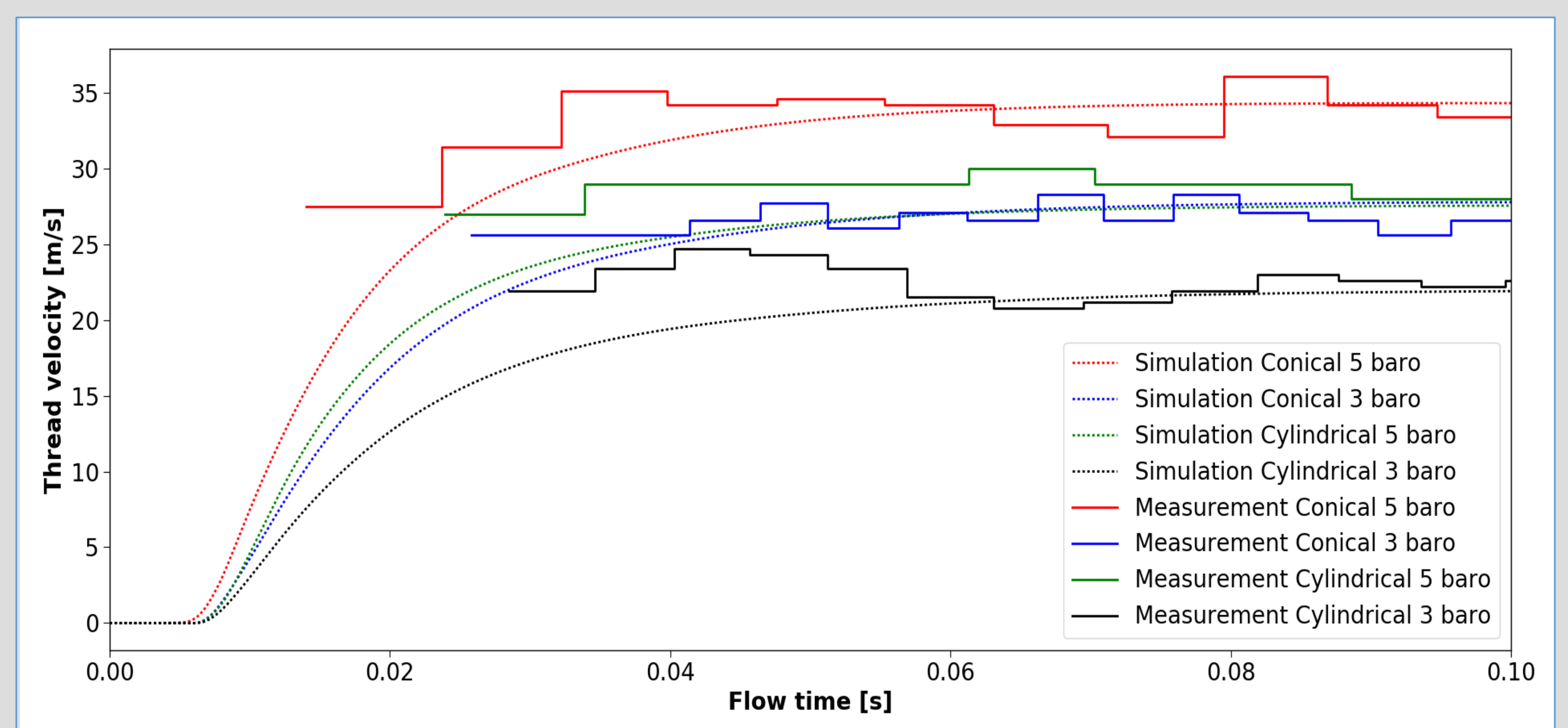
Use of fluid-structure interaction simulations



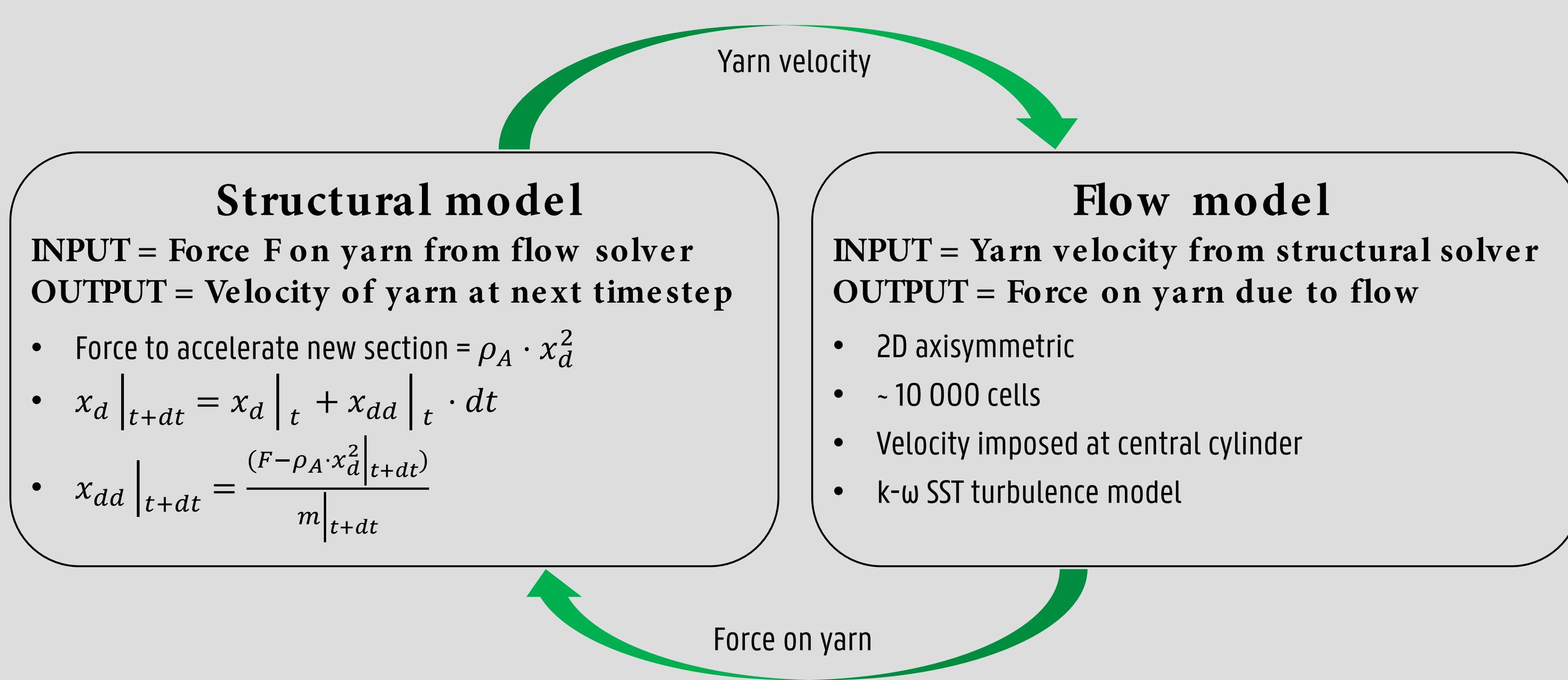
Experimental setup



Transient simulations



Explicit FSI-model



Steady state example

Conical at 5 bar overpressure
Average pressure = 563939 Pa

Iteration	Velocity [m/s]	Calculated force [N]	Residual [N]
1	20.000	9.7363E-02	6.6963E-02
2	25.000	9.4527E-02	4.7027E-02
3	36.795	8.8051E-02	-1.4841E-02
4	33.965	8.9593E-02	1.9163E-03
5	34.298	8.9411E-02	5.5949E-05
6	34.299	8.9406E-02	2.0902E-06

Calculated velocity (34.3 m/s) agrees well with the transient simulation (34.2 m/s)

Future research

- Incorporate model for yarn hairiness
- Couple with more elaborate structural model
- Test in optimization cycle

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