

# Analysis of the amniotic fluid impact on the fetus during traffic accidents

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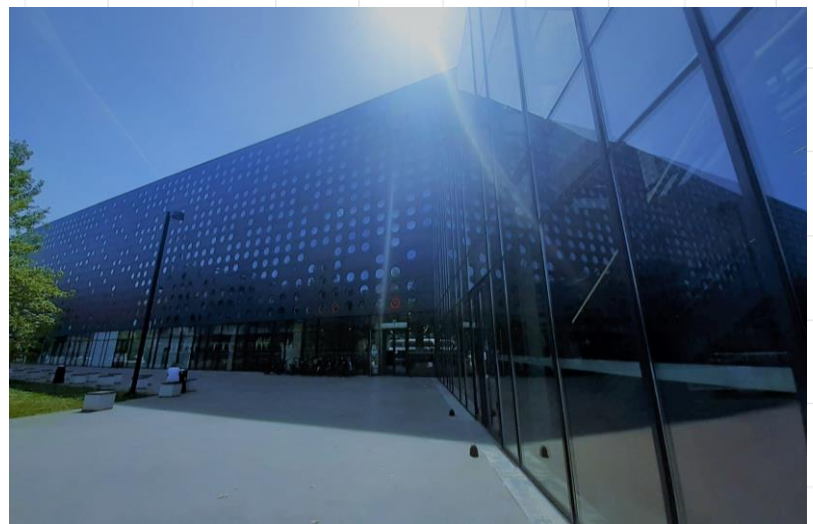
Faculty of Mechanical Engineering, Division of Automotive Engineering



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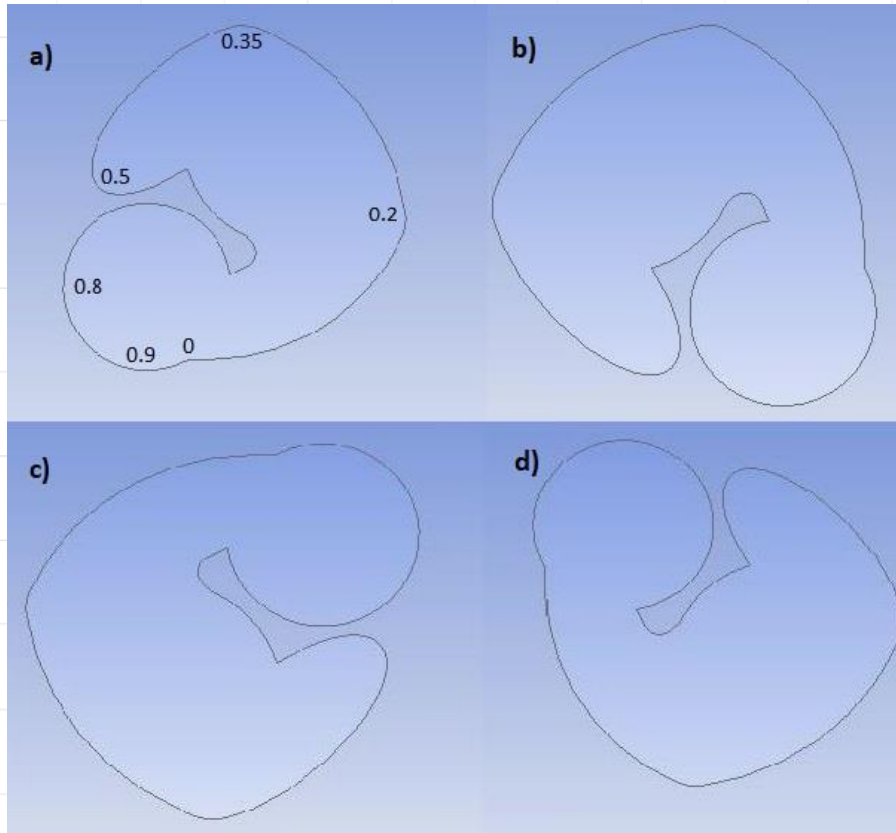


Figure 1. Numerical identification of the characteristic elements of the fetus along with the presentation of its four tested positions: a) initial position, b) rotated by 90 degrees, c) rotated by 180 degrees, d) rotated by 270 degrees.

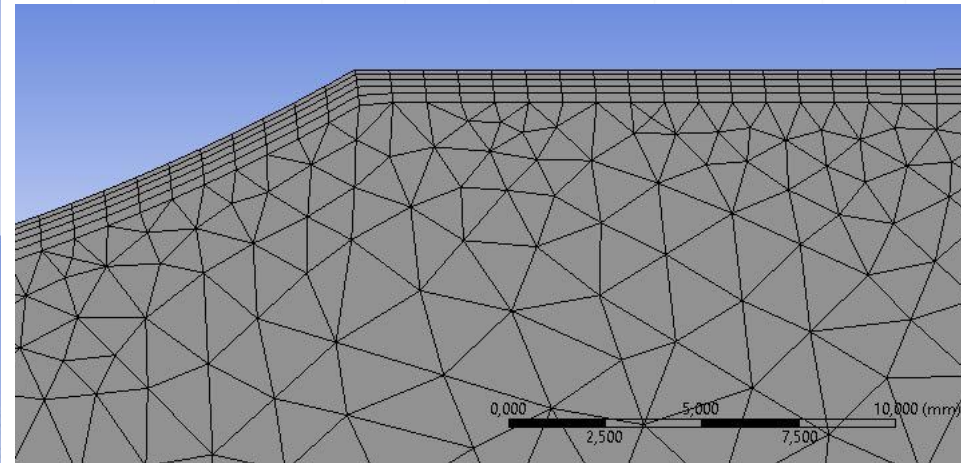


Figure 2. Inflation elements in the surroundings of the fetal model and visible transition to triangular elements.

# Results and discussion

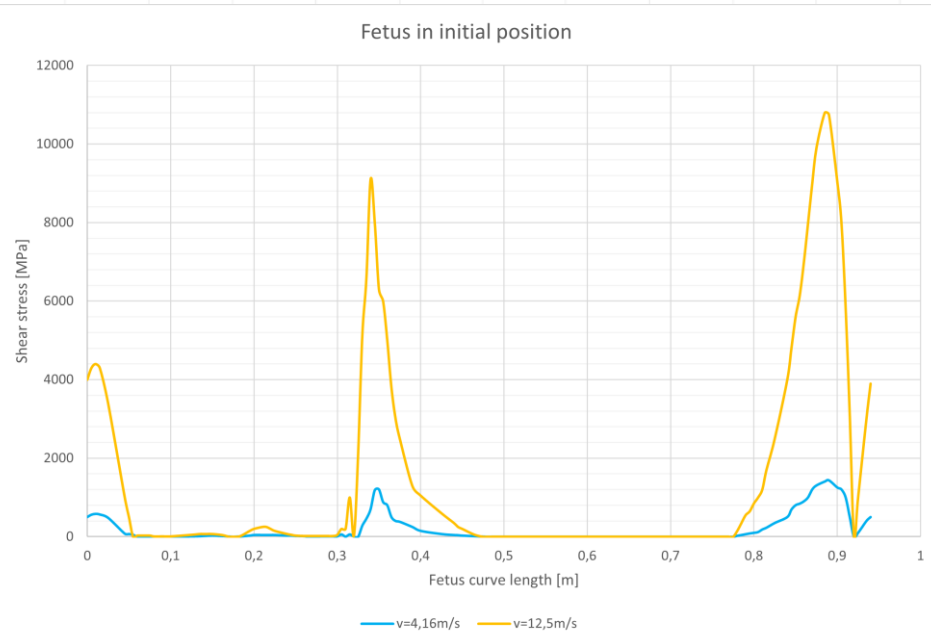


Figure 3. Distribution of shear stress on the fetus (initial position, amniotic fluid velocity set at 4,16 m/s and 12,5 m/s).

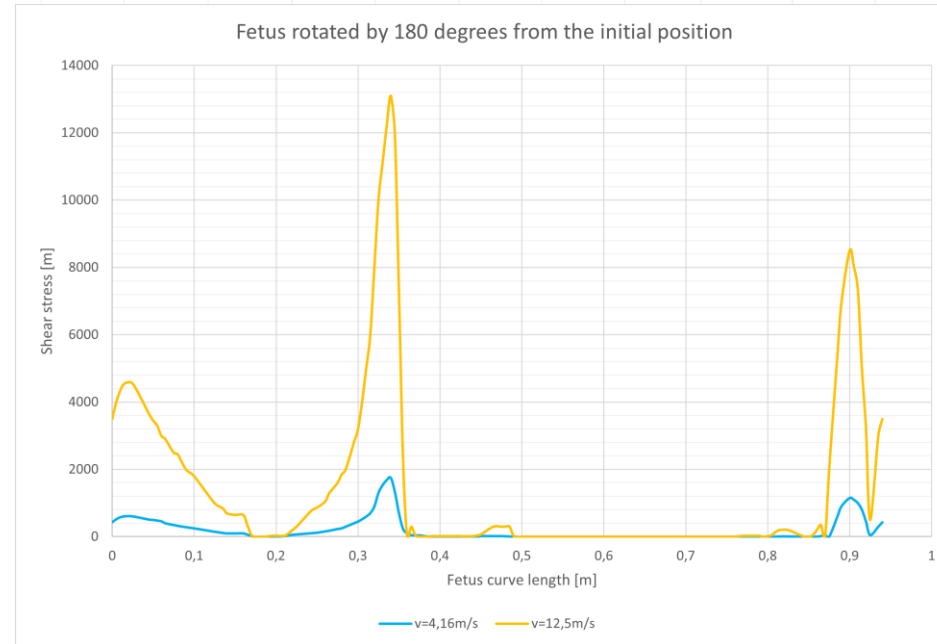


Figure 4. Distribution of shear stress on the fetus (position rotated by 180 degrees, amniotic fluid velocity set at 4,16 m/s and 12,5 m/s).

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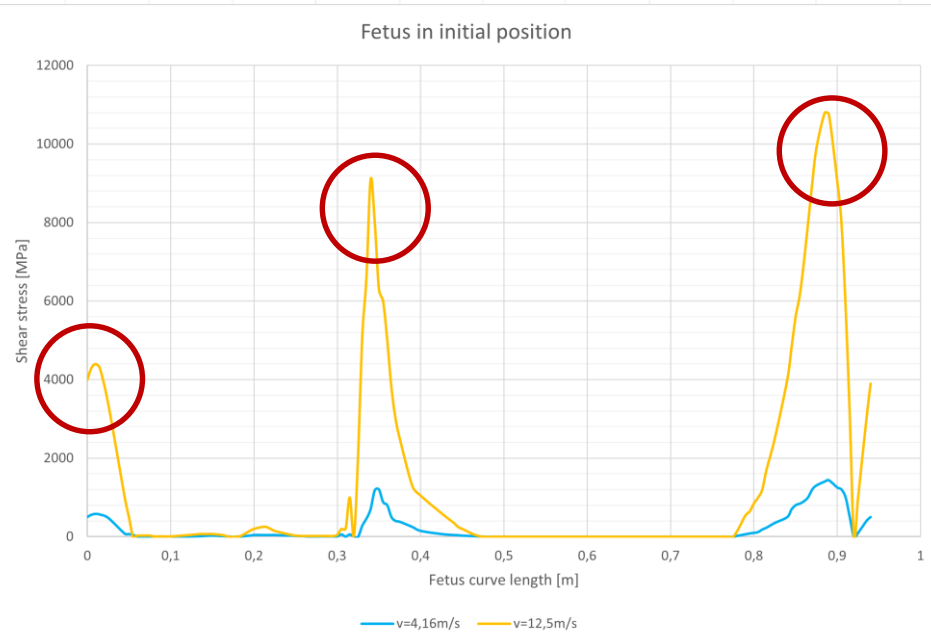


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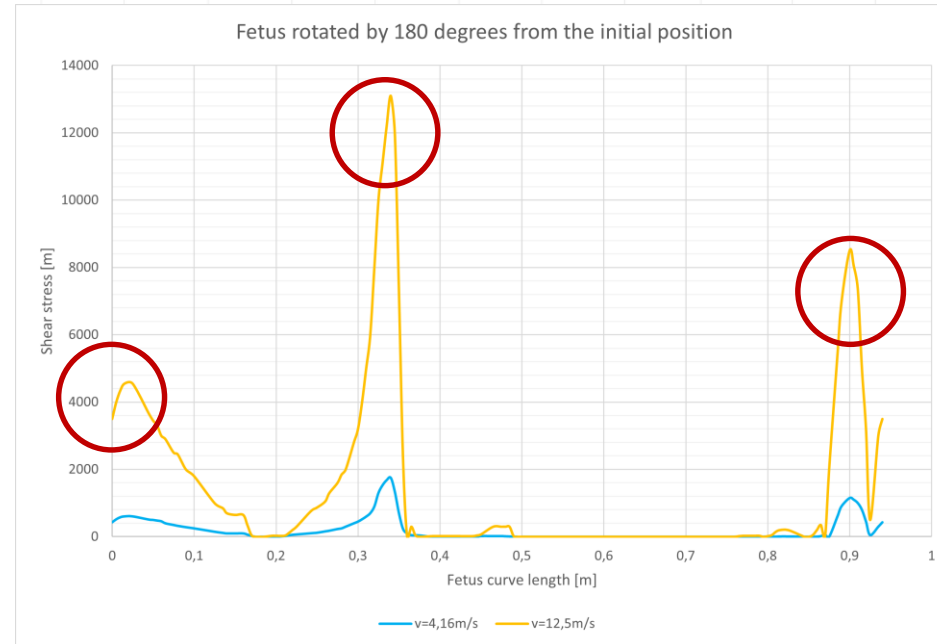


Figure 4. Distribution of shear stress on the fetus (position rotated by 180 degrees, amniotic fluid velocity set at 4,16 m/s and 12,5 m/s).

# Results and discussion

Fetus rotated by 90 degrees from the initial position

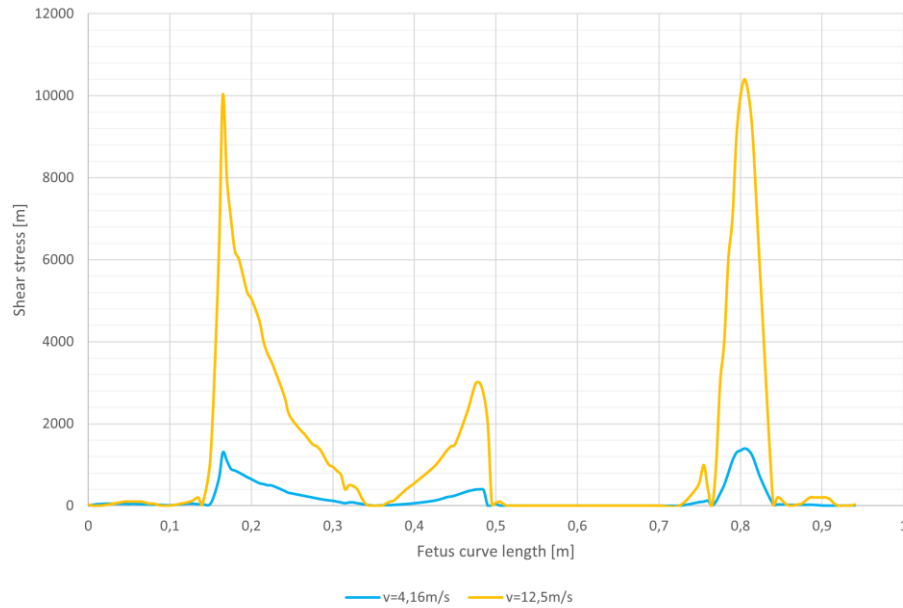


Figure 5. Distribution of shear stress on the fetus (position rotated by 90 degrees, amniotic fluid velocity set at 4,16 m/s and 12,5 m/s).

Fetus rotated by 270 degrees from the initial position

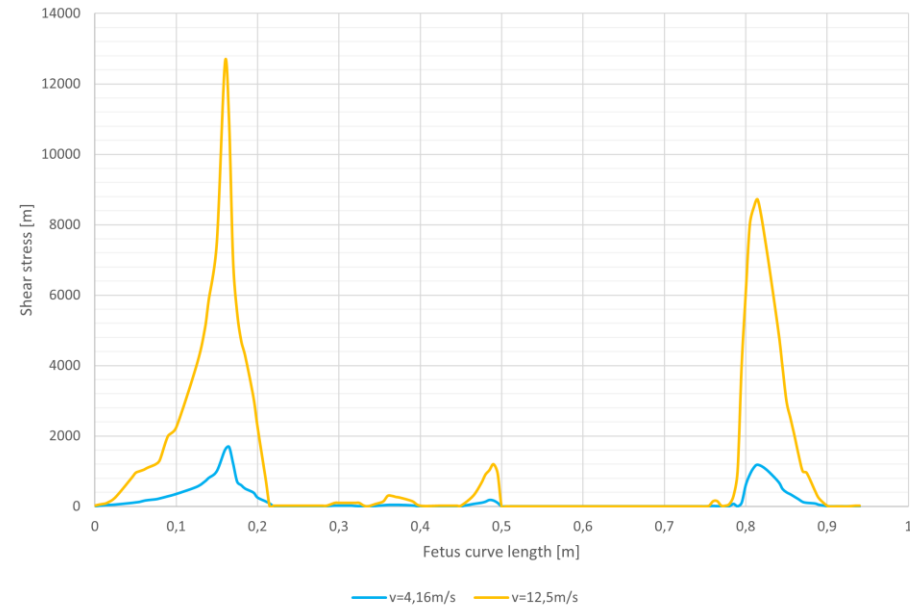


Figure 6. Distribution of shear stress on the fetus (position rotated by 270 degrees, amniotic fluid velocity set at 4,16 m/s and 12,5 m/s).

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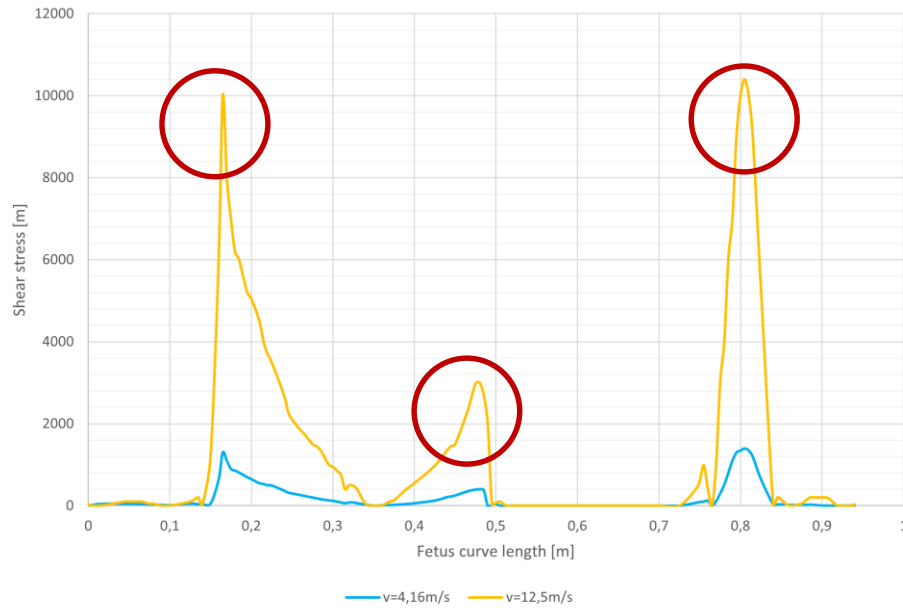


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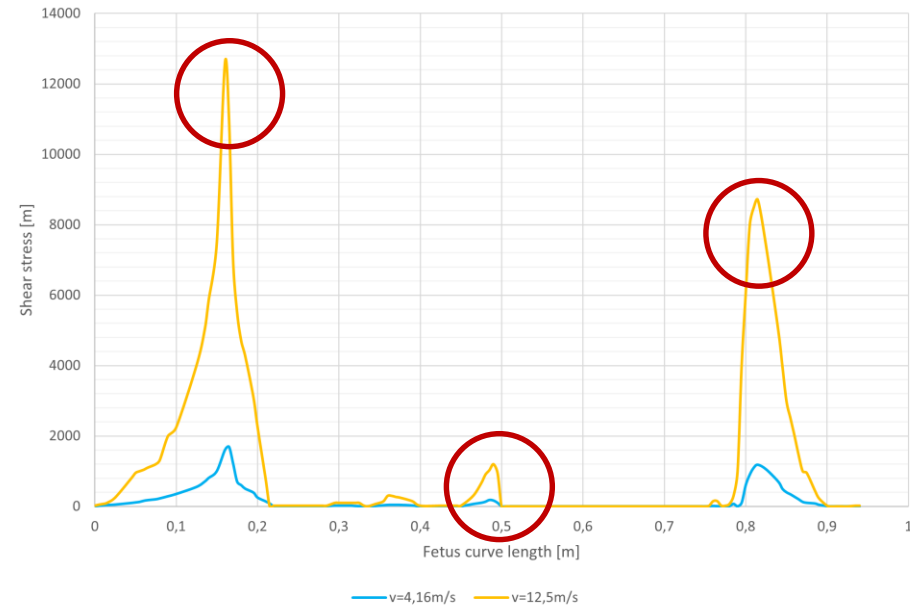


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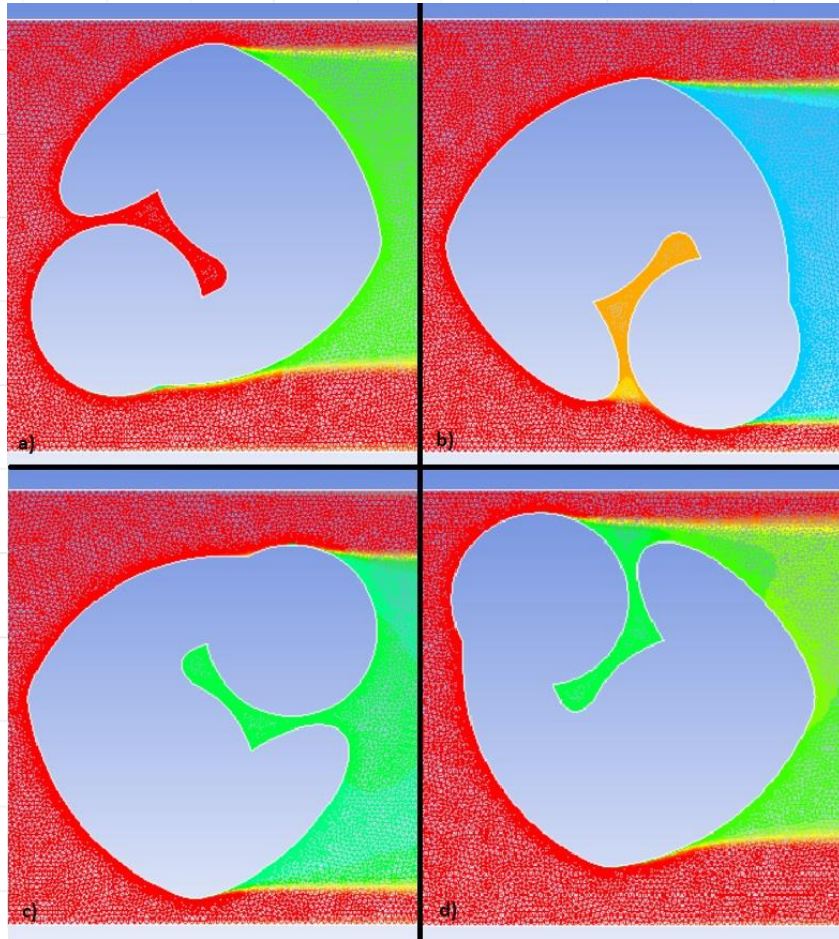


Figure 7. The visual representation of the pressure distribution areas during simulation of the model (constant pressure - red and underpressure - green): a) initial position, b) rotated by 90 degrees, c) rotated by 180 degrees, d) rotated by 270 degrees.

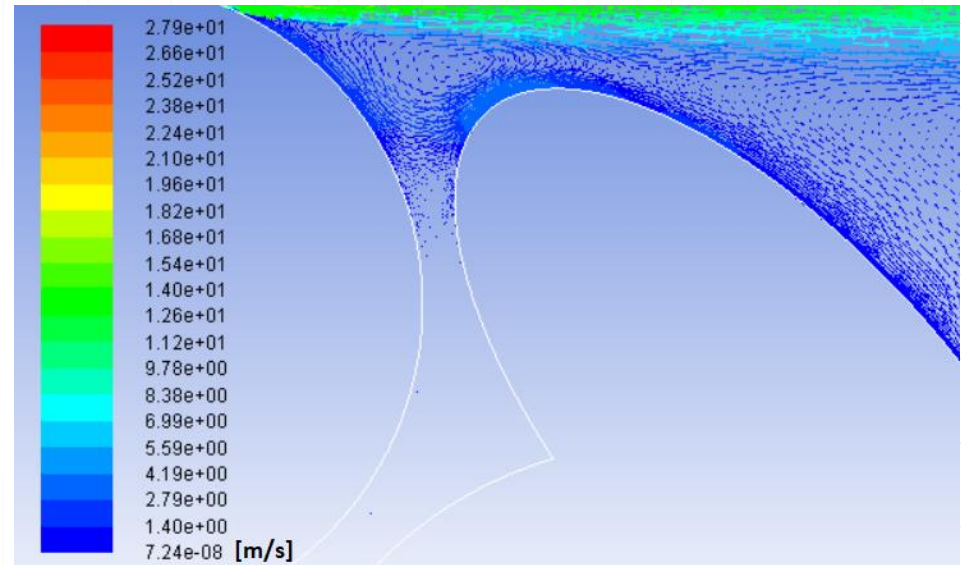


Figure 8. Distribution of the velocity of the amniotic fluid around the fetal head -fetus rotated by 270 degrees from the initial position (dark blue – fluid vortices).

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