

Erratum: “Fiber Orientation Control Related to Papermaking” [ASME J. Fluids Eng., 2007, 129(4), pp. 457–465]

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Three errors have been detected in a further analysis of the data.

- The first error is that the reported frame rate of the camera is incorrect. This means that the velocities of the fibers should be divided by two. Another consequence is that the wall normal distance from the wall y will be roughly (velocity gradient not constant) half of the previously reported values.
- The second error is that the computed theoretical concentration profile is incorrect.
- The third error is that the reported fiber diameter is incorrect.

These errors do not affect the two main results: (i) fibers near the smooth wall orient themselves perpendicular to the flow direction at the wall and (ii) near the structured wall fibers oriented perpendicular to the flow direction are absent. Nevertheless, the corrections affect Figs. 14–16 and Secs. 2.3, 2.4.3, 2.5, 4.1, 4.2.2, 4.2.3, and 5.

Section 2.3 Fiber Suspension:

- The fiber diameter, given in the second sentence of the second paragraph, should be changed to $d \approx 70 \mu\text{m}$.

Section 2.4.3 Particle Tracking Velocimetry:

- The correct value of the frame rate is $f = 5.13 \text{ Hz} \pm 0.05 \text{ Hz}$.

Section 2.5 Velocity Profile of Fibers:

- The fiber diameter in line number nine of the section should be changed to $d \approx 70 \mu\text{m}$.

Section 4.1 Jeffery Orbits Close to the Wall:

- In the first sentence of the section “... one fiber length away from the wall...” should be changed to “... half a fiber length away from the wall...”

Section 4.2.2 Wall-Normal Concentration Distribution:

- Due to the incorrect computation of the theoretical concentration profile (corrected in Fig. 14) the discussion on this, as well as the comparisons between the theoretical and experimental profiles, is faulty. Thus, ten lines of text should be disregarded. This is the text, in the first paragraph in the second column, that reads “The assumptions above... becomes steeper and steeper.”
- The second paragraph in the second column should be changed to “The experimental data from the flow over the smooth surface in Fig. 14 (solid) show a high concentration

close to the wall (i.e., a lot of slow fibers), followed by a decrease and then an increase up to $nl^3 \approx 0.5$ at $y/l \approx 0.6$. Above $y/l \approx 0.6$, the number of fibers found in the images decreases.”

- The first sentence in the third paragraph in the second column should be changed to “For the flow over the structured surface, the concentration profile in Fig. 14 looks different and does not have the sharp peak close to the wall.” In the second sentence of the same paragraph “These differences have to be...” should be replaced with “This difference has to be...”

Section 4.2.3 Orientations at Various Distances From the Wall:

- The last sentence of the second paragraph on page 464 (lines 21–22 in the column) “... $y/l = 0.2 - 1$...” should be changed to “... $y/l = 0.2 - 0.5$...”
- The second last sentence of the third paragraph on page 464 should be replaced with “For $y/l > 0.5$, most of the fibers are oriented in the flow direction, in the region $0.2 < y/l < 0.5$ the distribution is more homogeneous.”

Section 5 Conclusions:

- In the second paragraph “... less than about a quarter of a fiber length...” should be replaced with “... less than about an eighth of a fiber length...”

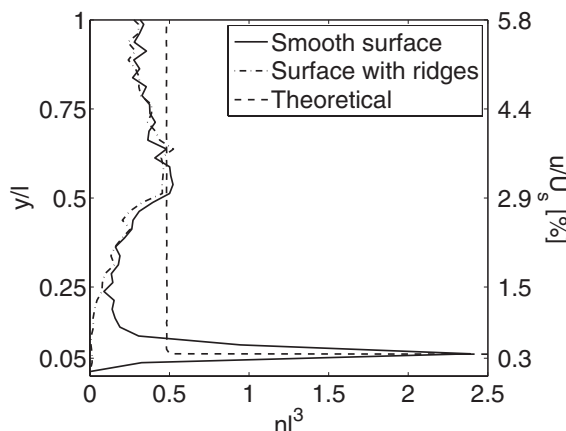


Fig. 14 Variations in concentration as a function of the distance from the wall (camera position P4)

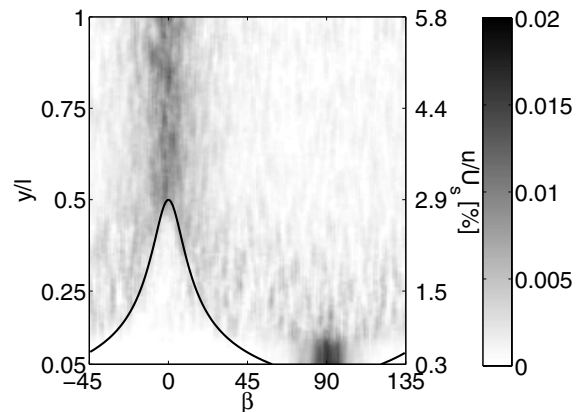


Fig. 15 Fiber fraction as a function of β for different distances from the wall. Measurements performed on smooth surface (camera position P4).

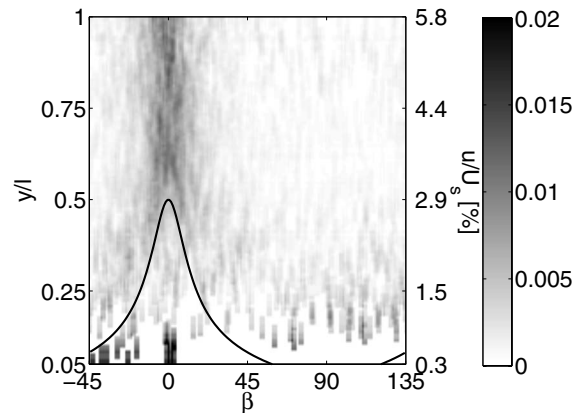


Fig. 16 Fiber fraction as a function of β for different distances from the wall. Measurements performed on surface with ridges (camera position P4).