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Nonlinear Processes in Geophysics
Discussions
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Interactive comment on "Dual plane PIV investigation of acoustically excited jets in a swirl nozzle" *by* G. S. Regunath et al.

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1) Query: It would be better to include a Figure, or to modify Figure 1, to show the position of the loudspeakers. If I have well understood there are four couple of loudspeakers, each couple emit sound in phase, and the different couples are arranged like in a windrose at 45, however, it would be more immediate with an image.

Response:

An extra figure, fig. 1, has been added to the manuscript that shows the position of the loudspeakers.

2) Query: Regarding the images some more details should be given like the resolution and the acquisition frequency so that the reader could understand which time span is

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associate to the 1000 images pairs and, consequently, what is the time span of the average images reported in the paper.

Response: In order to better explain the resolution and acquisition frequency, the following text has been added to the manuscript:

"The PIV system was limited to the frequency of cameras, which was 4Hz. Therefore 1000 image pairs were recorded at a frequency of 4Hz over a period of approximately 250s."

3) Query: Regarding the velocity profiles shown in Figure 4, it is not clear at what distance y are calculated or if they are an average along the y direction. Please explain. Additionally, would the feature shown here (larger velocities for the unexcited jet) be valid also at other distance y or this is a y-dependent feature?

Response: To answer this comment, the following has been added to the manuscript:

"For these measurements, the light sheets were placed parallel to the y-axis, so that the jet centreline is measurable. The results show the average axial velocities along the jet centerline axis for the case of an unexcited jet and for excited jets at different St numbers."

The horizontal axis in Fig. 4 (Fig. 5 in revised manuscript) should have been labelled "y", not "x". This has now been corrected, which will clarify the second part of question (3) from the referee.

4) Query: Authors should give an estimation of the uncertainties associated to the vorticity, helicity and to the helicity angle. This is an important information useful in the discussion (page 1416 lines 4-8) in which an angle of 178.5 is considered different from 180. Is this coherent with the uncertainty estimates?

Response: The following text has been added to the manuscript concerning the uncertainties:

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"The relative uncertainties in the vorticity components omega_x, omega_y and omega_z were 19%, 16% and 6% respectively. For helicity, the relative uncertainty was found to be approximately 13%".

The final 2 sentences of the paper have also been rephrased so that the helicity angle of 178.5 degrees is regarded as close to maximal.

5) Query: What particle tracers are used as seeding

Response: It has been added to the manuscript that "Water droplets generated by an ultrasonic humidifier were used as tracer particles."

Interactive comment on Nonlin. Processes Geophys. Discuss., 2, 1407, 2015.

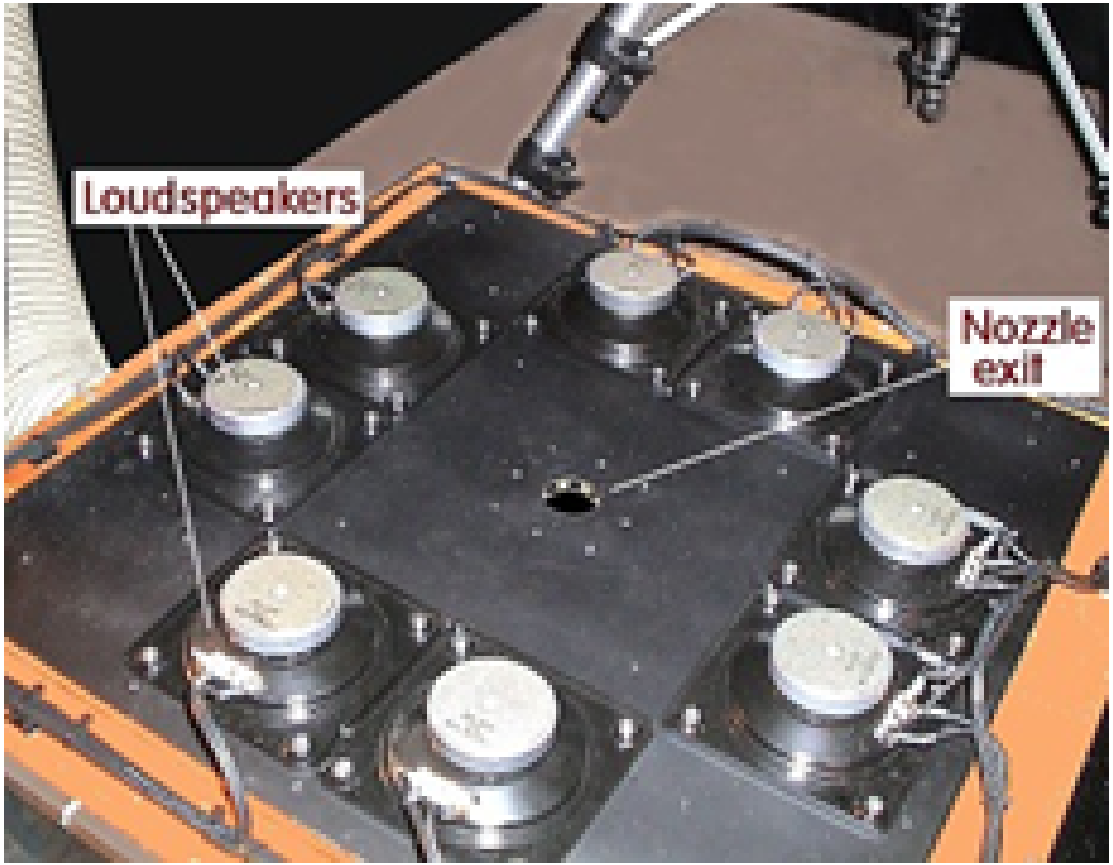

Fig. 1.

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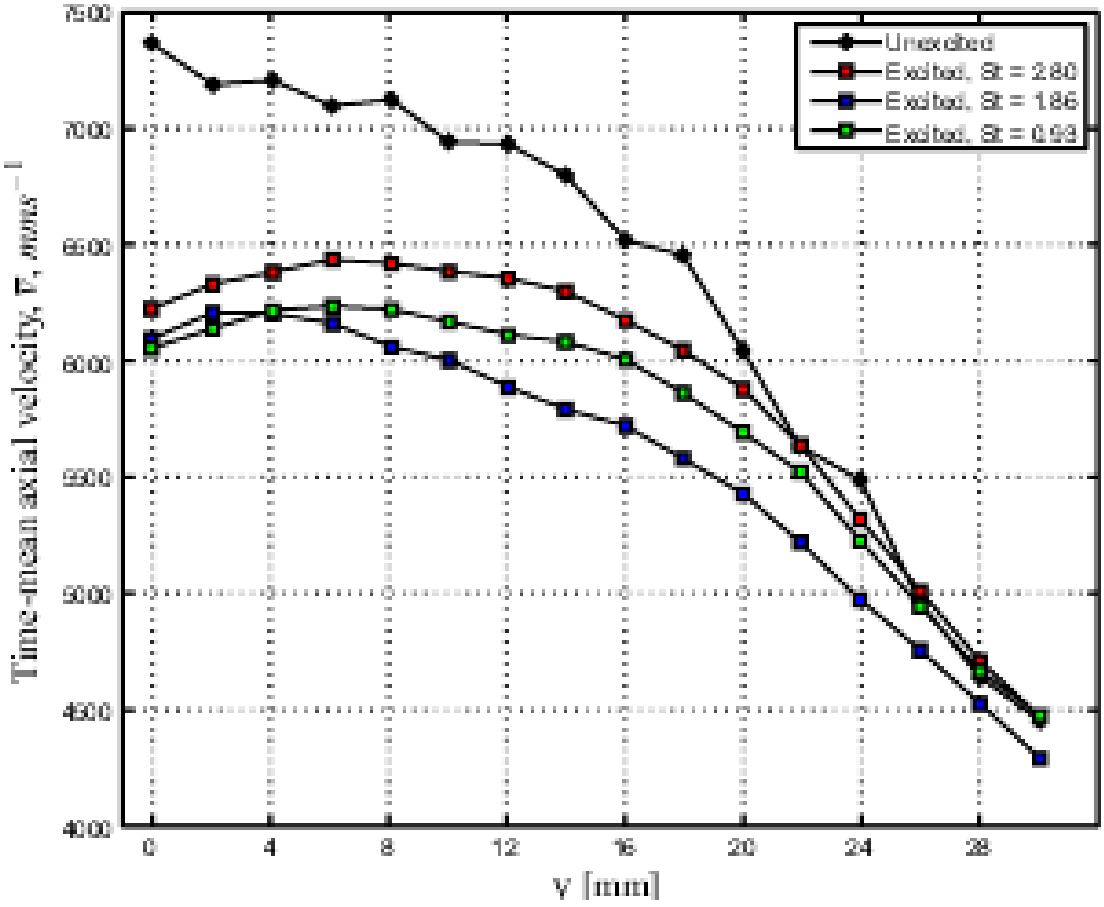

Fig. 2.

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