Casarella (1991), yet the authors report higher values of RMS pressure. If higher values of RMS pressure are due to an improvement in the resolution of high wavenumber pressures then the frequency content of the spectra shown in figure 7 should exceed that of the comparative data. These issues need to be addressed before the merit of these transducers for wall pressure measurements can be fully established.

Authors' Closure

We would like to thank our colleagues for all comments and positive criticism on our work. Here we also want to state that we sincerely believe that their comments have improved our understanding of the topic and also pin-pointed some difficulties and unanswered questions in the field of wall pressure fluctuations. Below we try to answer the questions raised.

A general comment is the relatively high level of the low frequency part of the spectra. Different origins are suggested like background and acoustic noise, non-equilibrium flow and free stream oscillations. So far, we have not been able to separate these external pressure sources from internal turbulent pressure sources. Hence, the only conclusion we have is that the electrical disturbances and internal sensor noise level are equal to the noise level shown in Figure 5. This was tested by the acoustical shielding of the sensor at a free-stream velocity of 30 m/s and the same noise level as the one shown in Figure 5 was found.

We would particularly like to thank Dr. Bandyopadyay for his constructive suggestion with regard to the interpretation of Figure 4. The suggested Reynolds number and d^+ dependence of the rms values seems plausible. We therefore fully support the interesting finding of a systematical variation of sensor dimension and Reynolds number. Morever, Dr Bandyopadyay also asks about the venting of the pressure sensor arrays. As shown in Figure 1, the vent outlet for each sensor is in the end of the chip opposite the pressure sensor diaphragm, about 3 mm distant. e.g. in Kälvesten et al. (1996) a model developed for sensor modelling shows that this vent channel length is more than sufficient. For the multi-sensor array each pressure sensor has its own vent channels with separate outlets with a spacing of 2 mm. A comment is also made about our low advection velocities. We find it plausible that a small sensor resolves small eddies which are created to a significant extent in the buffer layer where the advecting velocity is lower than further out in the boundary layer.

Professor Panton wants to know how the noise level of Fig. 5 is determined. We obtained this level for the 100 μm sensor mounted in situ inside the wind tunnel and at zero flow. Of course, the noise level of the 300 μm sensor should also have been given in the paper, but this level is very close to that of the 100 μm sensor, within 3 dB, so we omitted the noise level of the 300 μm sensor in order to avoid a cluttered figure. Moreover, Professor Panton suggests using an increased lower frequency limit as has been used by other investigators. We agree, but we also want to point out the difficulties in choosing the frequency cut-off limit. To this end we have no explanation for the only positive values of the correlation coefficient of Fig. 8. We are interested in suggestions concerning a physical interpretation of positive and negative values of this correlation.

Dr. Keith suggests that the unexpected low level of high frequency of the spectra may be due to the various sensors' responses to the high wave-numbers. Furthermore, he concludes that this kind of frequency-wave number calibration method is not available at the present time, but that the sensor modelling for high frequencies and wave numbers would be very useful. The authors agree and thank him for his positive reaction to our paper.

Dr. Farabee and Professor Casarella compare the frequency spectra of Fig. 7 for our investigation to other experiments. They conclude that the high frequency level of our small sensors should be higher than the comparable data. Maybe this is correct, but as Dr. Keith suggests, a wave number-frequency calibration would be required. This issue remains open now.

Additional Reference

Kälvesten, E., Löfdahl, L., and Stemme, G., 1996: Analytical Characterization of Piezoresistive Square-Diaphragm Silicon Microphone, *Sensors and Materials*, Vol. 8, No. 2, pp 113–136.