Supplementary Materials

Evaluation of Microchannels for Particle Measurement Fabricated with a Consumer 3D Printer

Yukichi Horiguchi[1] · Masato Yasuura[1] · Hiroki Ashiba[1] · Ken-ichi Nomura[1]

[1]Sensing Technology Research Institute (STRI), Department of Electronics and Manufacturing, National Institute of Advanced Industrial Science and Technology (AIST), Central 5, 1-1-1 Higashi, Tsukuba 305-8565, Ibaraki, Japan

Correspondence: Yukichi Horiguchi (y-horiguchi@aist.go.jp)

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Data Analysis Using minascouter

Each time a particle passed through an aperture, a current pulse was recorded, as shown in Figure S1.

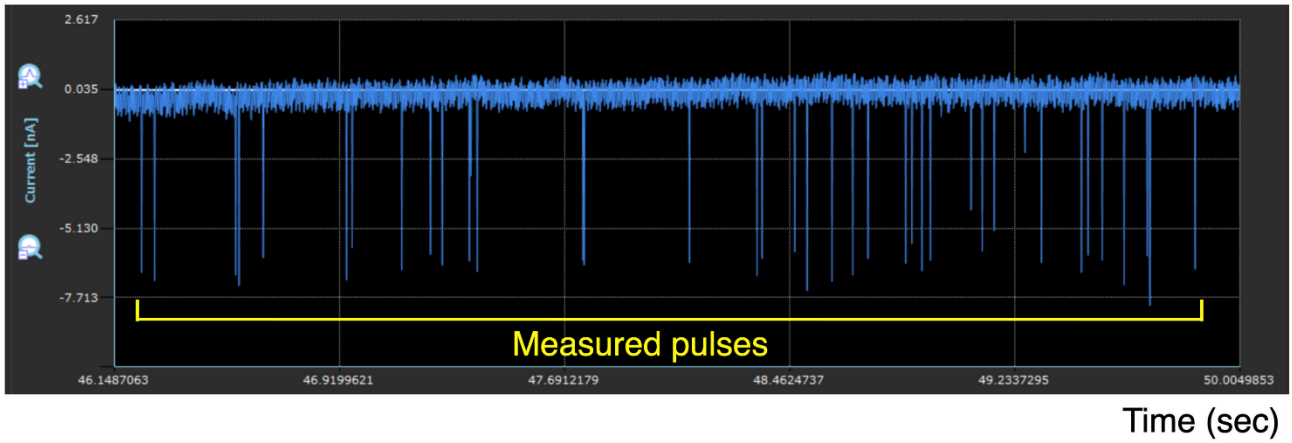


Figure S1 Example of measurement data

From the obtained current values, minascouter extracted the pulse regions as shown in Figure S2. The extracted pulses were used for analysis.

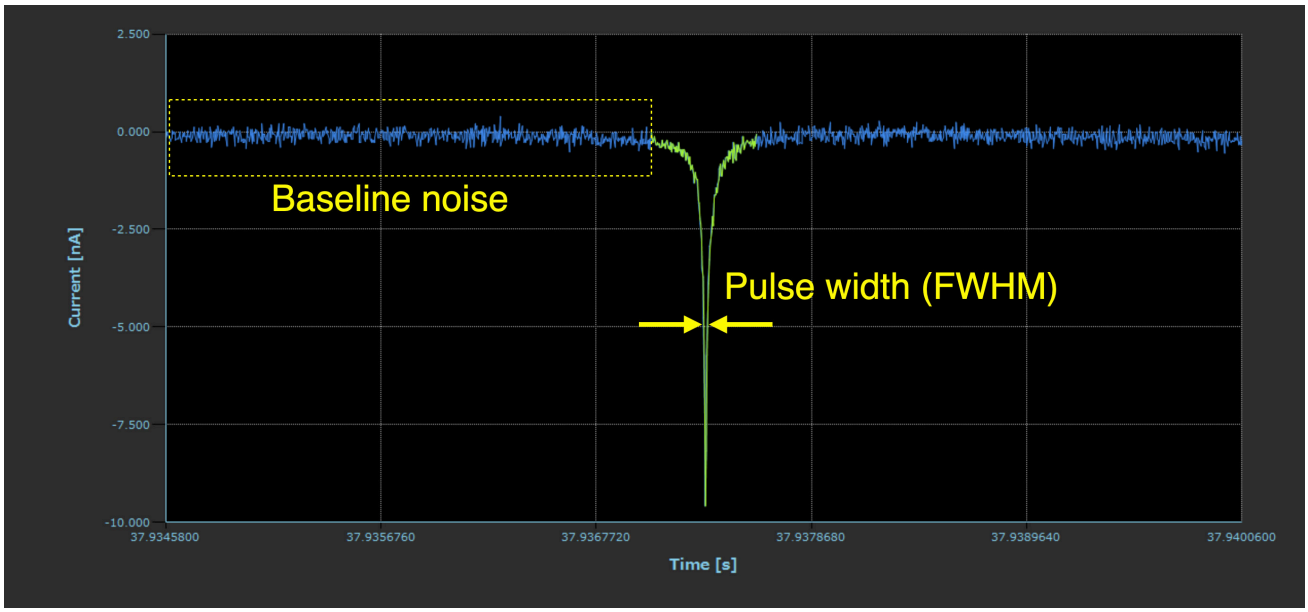


Figure S2 The representative pulse shown here had a pulse height of 9.51 nA and a pulse width (FWHM) of 19 µs. The baseline fluctuations immediately preceding the pulse had a standard deviation of 0.138 nA (n = 619 points, approximately 2.48 ms).

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Figure S3 shows the trend of pulse count over time. By fitting a regression line to these data, the count rate shown in Figure 4 can be derived.

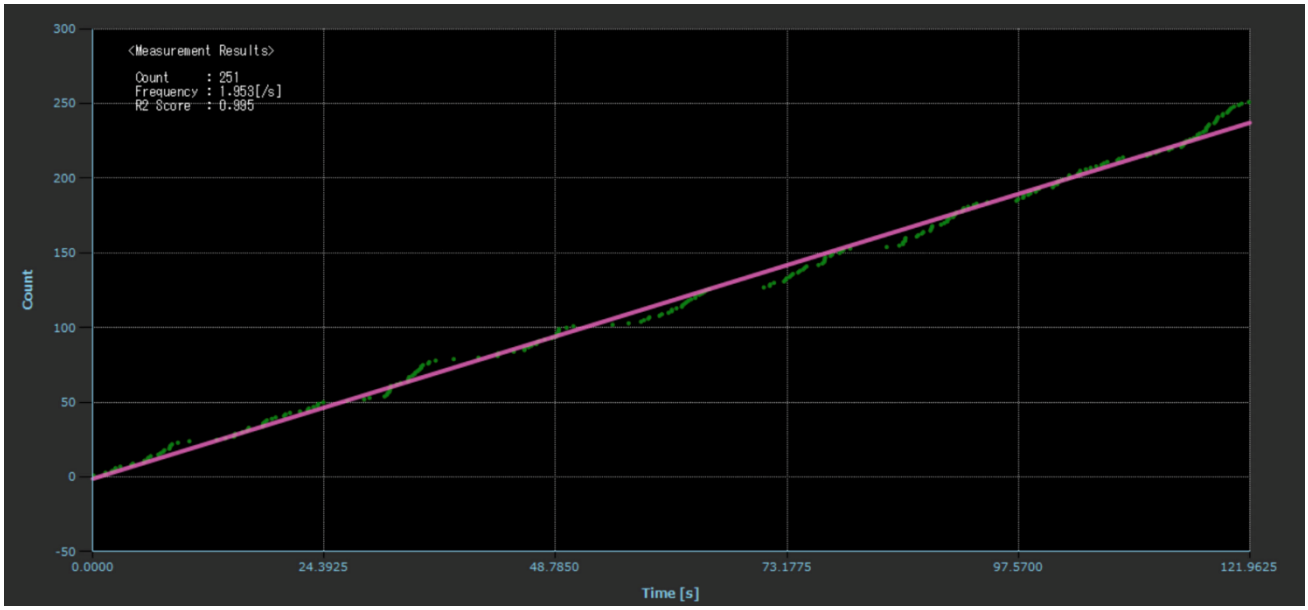


Figure S3. Example of time vs. pulse count trend

Additionally, Figure S4 is a scatter plot with pulse width on the x-axis and pulse height on the y-axis for the obtained pulses. Based on this plot, a histogram with pulse width (FWHM) bins of 10 μs was created, which is shown in Figure 6.

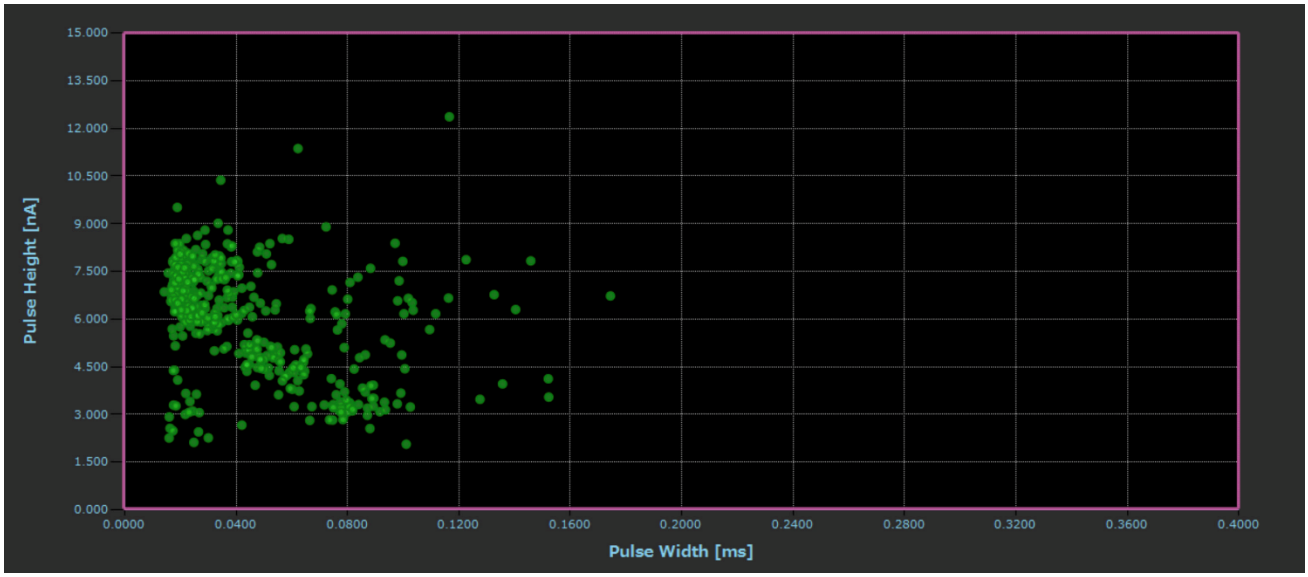


Figure S4 Example of scatter plot of pulse measurements

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Examples of Size Variation of Obtained Microchannels

A template for a 50-µm-wide microchannel was produced using a 3D printer and served as a mold to fabricate microchannels. The sizes of the resulting microchannels were measured.

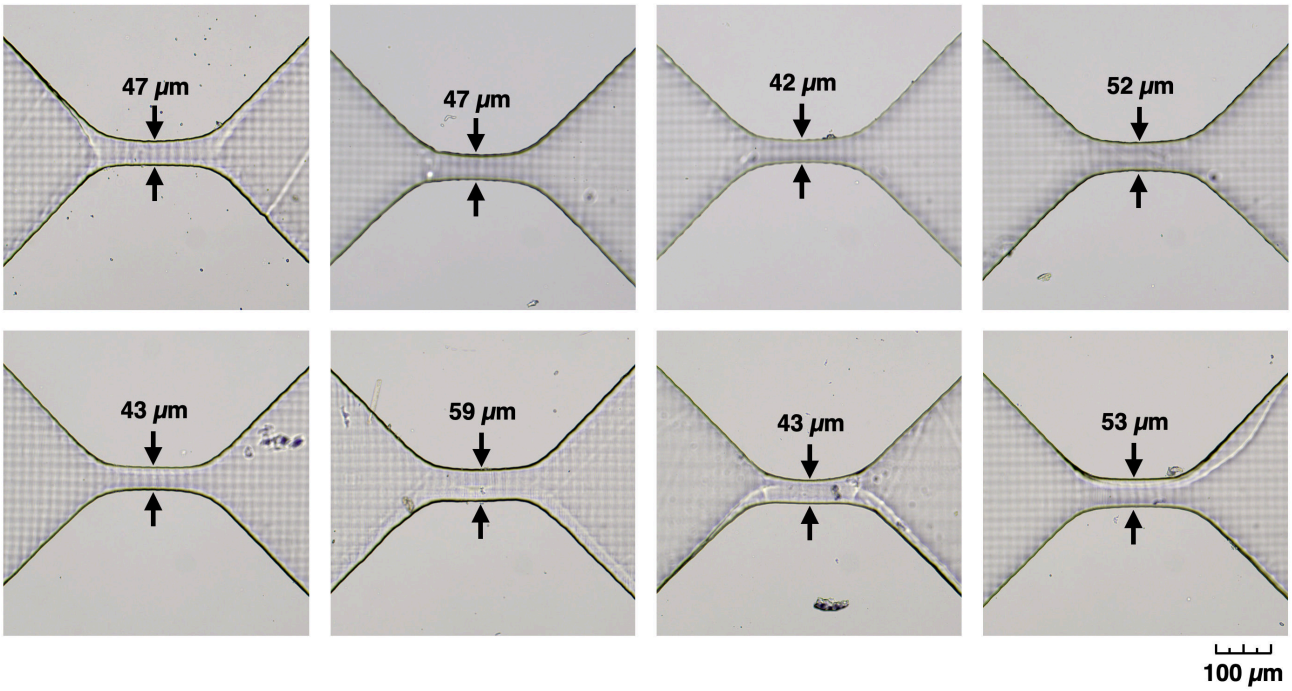


Figure S5 Examples of obtained microchannels designed with a width of 50 µm.

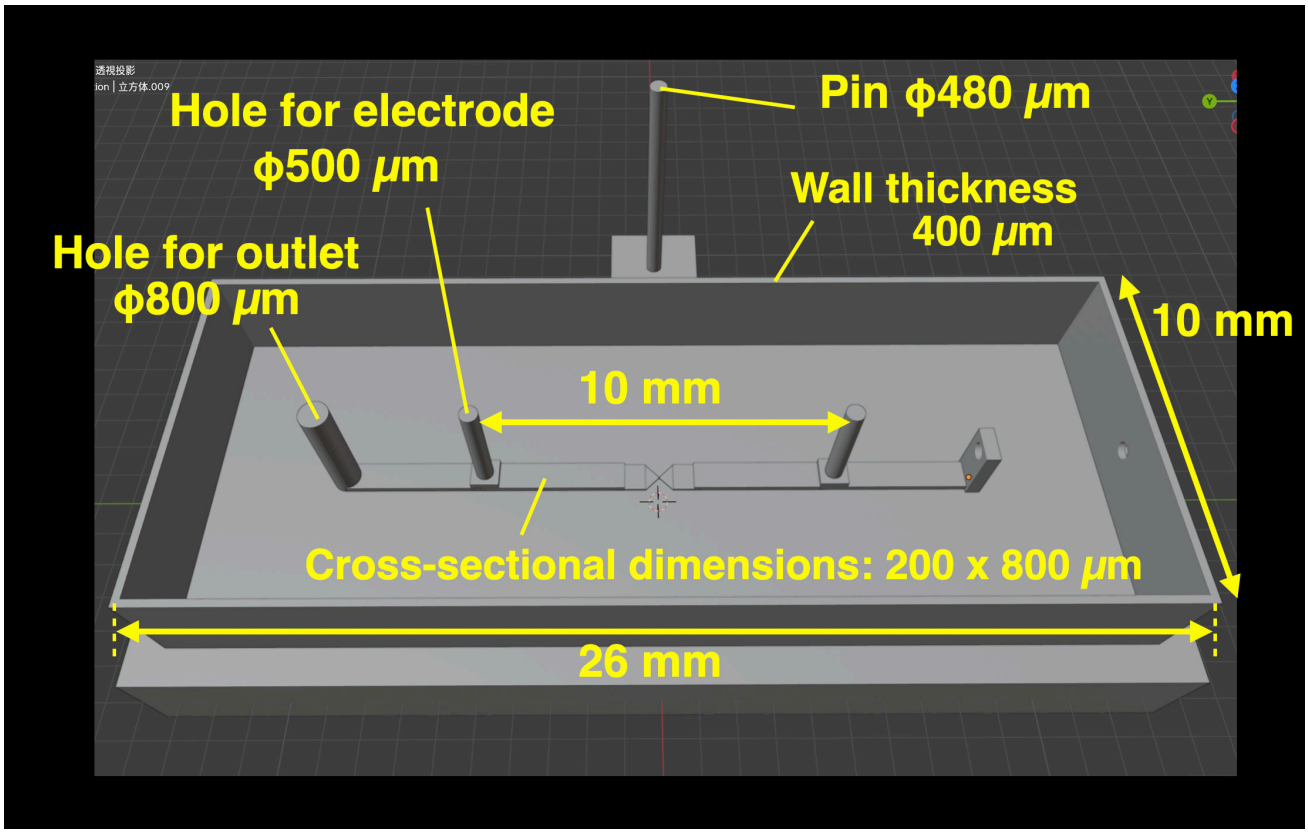


Figure S6 Principal dimensions of the mold fabricated using the 3D printer.