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Wavenumber spectrum $S(k, t, r)$ measurements using a frequency comb Doppler reflectometer in combination with a phased array antenna

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The simultaneous oscillation of multiple frequencies and the use of a phased array antenna make it possible to measure the instantaneous radial distribution of the wavenumber spectrum $S(k, t, r)$. To realize this, we are developing the phased array antenna which is additive manufactured by a 3D metal printer. In particular, with regard to surface treatment, we have succeeded in applying copper plating to the antenna made of aluminum material, which was sandblasted and chemically polished in the previous workshop report. In addition, we will also show an example of antenna using stainless steel material.

We plan to combine this phased array antenna with a frequency comb oscillator that can generate multiple frequencies simultaneously, and this development is currently underway. Performance evaluation using an initial test bench will also be presented.

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