dSpec, dead-time free spectrometer for WISP searches using 5G telecommunication technologies
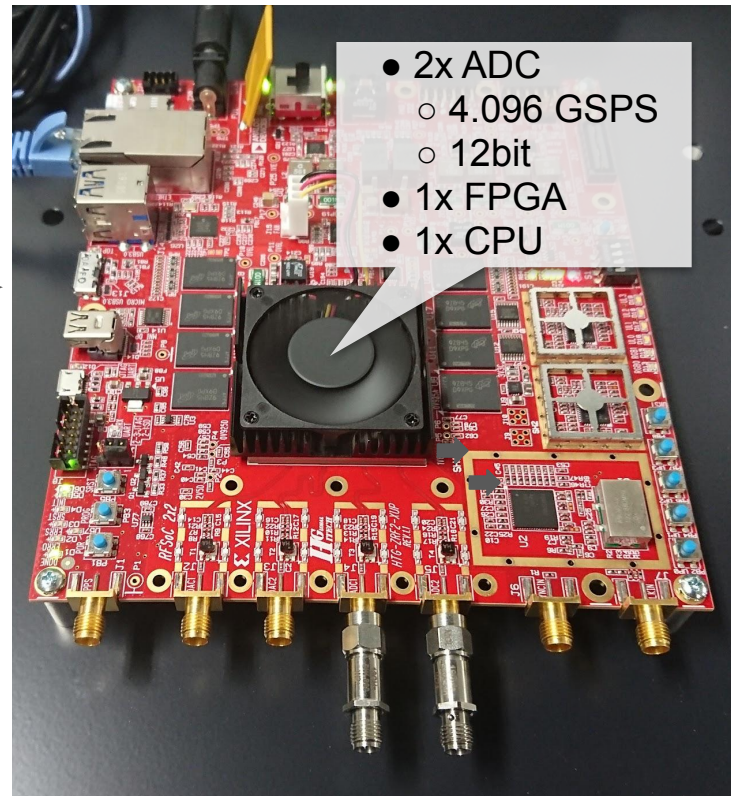
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WISP search using a dish antenna requires a wide bandwidth & deadtime-free spectrometer.

We developed a new spectrometer "**dSpec**" by using a **RFSoC 2x2 board**.

We implemented deadtime-free FFT logic on it. We achieved wide bandwidth of 4 GHz with sufficient frequency resolution.
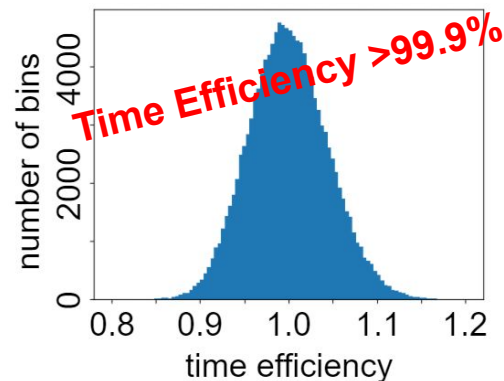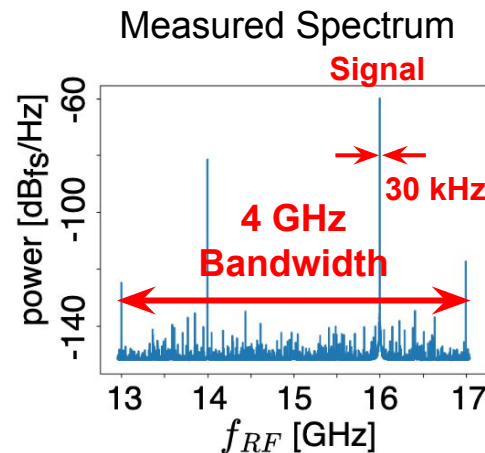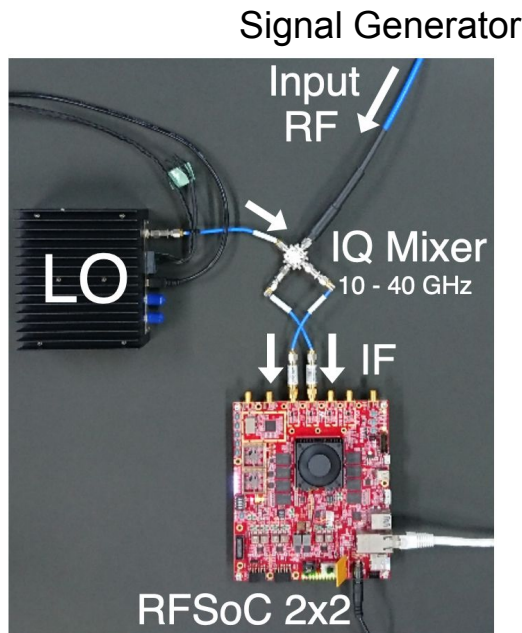
We evaluated the performance of dSpec.

➡ Next page

- 2x ADC
  - 4.096 GSPS
  - 12bit
- 1x FPGA
- 1x CPU

Evaluation Results of **dSpec**

✔

We input a test signal of 16 GHz.
We successfully measured the signal
with good frequency resolution.
We also confirmed 4 GHz bandwidth.

✔

We also evaluated time efficiency,
and we confirmed more than 99.9%
efficiency.

Signal Generator

Input
RF

LO

IQ Mixer
10 - 40 GHz

IF

RFSoC 2x2

Measured Spectrum

Signal

30 kHz

4 GHz
Bandwidth

power [dBfs/Hz]

f_{RF} [GHz]

Time Efficiency >99.9%

number of bins

time efficiency

If you are interested in dSpec, please come to my poster!