High-Frequency Low-Distortion Two-Tone Signal Generation Using Arbitrary Waveform Generator

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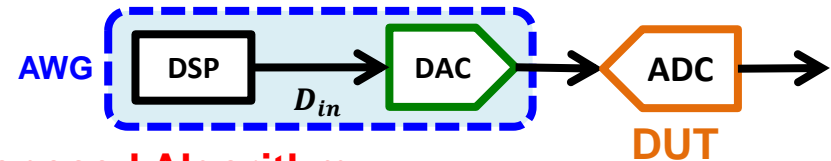*Division of Electronics and Informatics, Gunma University, JAPAN*

Research Objective

High quality signal generation for testing of ADC in communication system using low cost instrument

Approach

· Using low cost AWG
· Only DSP program change
· Phase-switching method

· ADC testing system

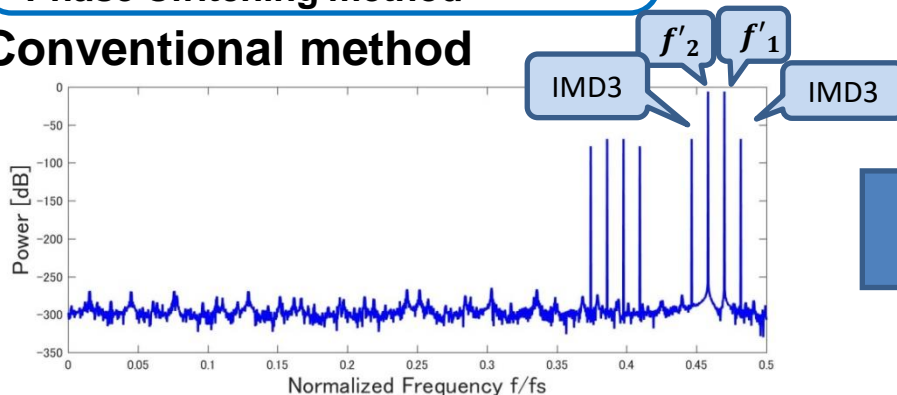## Proposed Algorithm

$$D_{in} = \begin{cases} X_0 = A\sin(2\pi f_1 nT_s + \varphi_0) + B\sin(2\pi f_2 nT_s - \varphi_0) & n:\text{even} \\ X_1 = A\sin(2\pi f_1 nT_s - \varphi_0) + B\sin(2\pi f_2 nT_s + \varphi_0) & n:\text{odd} \end{cases}$$

$$\varphi_0 = \frac{\pi}{N}$$

Nth-order IMD components are cancelled

· Conventional method

· Proposed method

IMD3 components are cancelled