Powered Arbitrary Waveform Generator beyond Trade-off between Resolution and Frequency

Tsuyoshi Konishi, Masayuki MAKINO, Tomoki TSUJI and Shizen NAKAYAMA
Osaka University, Suita, Osaka, , JAPAN, e-mail: konishi@ap.eng.osaka-u.ac.jp

Both of digital-to-analog converter (DAC) and analog-to-digital converter (ADC) are indispensable key-elements for extreme wideband applications for beyond 5G and 6G [1]. Their development would approach a plateau and face to a stagnant performance improvement due to the trade-off issues on resolution, cost, and power consumption as the signal frequency rises beyond GHz. In terms of DAC, their performance can be evaluated as that in an arbitrary waveform generator (AWG) and photonic AWG approaches are well-investigated [2-4] to synthesize an ultrafast optical arbitrary waveform. Since, however, all previously demonstrated schemes have the above inherent issues of GHz class electrical technology, we have recently proposed photonic-Assisted high frequency signal synthesis taking advantage of low frequency technology [5,6,7]. It can be regarded as a powered AWG which is remodeled from low-end AWGs so as to be beyond the above trade-off issue between resolution and frequency.

In this paper, we demonstrate some results of our proposed approach utilizing out conventional low frequency electrical technology, which can provide overwhelming competitiveness in analog resolution, cost, and power consumption except signal frequency.

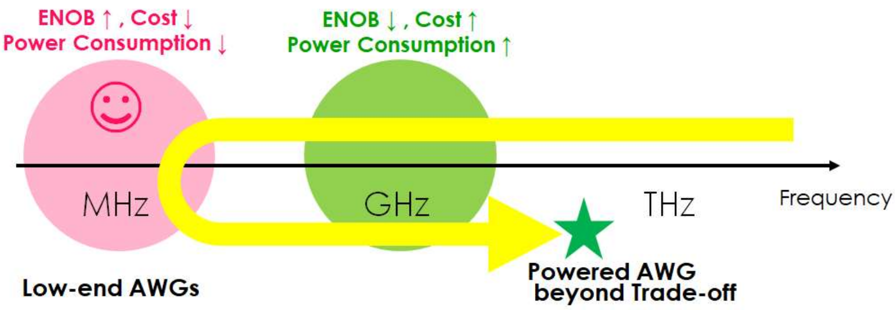

Figure 1. Proposed configuration for GHz class arbitrary waveform synthesis utilizing out MHz class low frequency technology

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