

**ICT Virtual Organization of ASEAN Institutes and NICT
ASEAN IVO Forum 2016
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I. Title—Title of presentation:

Toward a universal all-optical wavelength converter for future metropolitan area optical information networks

II. Author(s)—Full name (First name family name):

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III. Organization(s):

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IV. Topic selection:

2-B) Smart City

IV. Abstract:

Wavelength converter has been well studied as one of the key elements for increasing the efficiency and capacity of optical information networks, especially, when metropolitan area networks (MANs) nowadays are migrating from conventional reconfigurable optical add-drop multiplexing (ROADM) ring topology to mesh networks with the introduction of colorless, directionless and contentionless (CDC)-ROADMs. On the other hand, with the heterogeneous nature of optical signals in the network as well as the evolution to ever more complex modulation formats, the wavelength converter based on optical/electrical/optical (OEO) processes becomes very inefficient due to the increasing complexity and the need of continuously upgrades in accordance with the change of signal formats.

In this talk, we will introduce our recent development of a fully telecom-grade, upgrade-free, all-optical wavelength converter, which is led by AIST for realizing a sustainable optical network technologies free from energy and capacity crunch for the future information networks (<http://www.aist-victories.org/>). The wavelength converter, which is based on dual-stage counter-dithering four-wave mixing (FWM) processes in highly nonlinear fiber (HNLF), exhibits important features including: 1) modulation-format, and symbol-rate independent operations; 2) whole C-band, guard-band-less operations; 3) multiple channel operation; and 4) highly cascaded operation as erbium-doped fiber amplifiers (EDFAs). These exemplary characteristics of the wavelength converter makes it ready for deployment in the real systems.

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