

A Robust Overlapped-SCM WDM PON with a Standalone Burst-Mode OLT Receiver

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***Abstract*— We demonstrate an overlapped-SCM WDM PON using a burst-mode receiver capable of tracking instantaneous phase variations within the uplink. The receiver ensures proper alignment between the clock and up-converted data for efficient SCM down-conversion.**

I. INTRODUCTION

Subcarrier-multiplexing (SCM) has been widely proposed for single-feeder wavelength-division multiplexed (WDM) passive optical network (PON) architectures [1]. Among the

some phase shifters to generate phase shifted replicas of CLK_0 that are passed to a phase picker circuit; in that example $\pm\pi/2$ phase shifted clocks, namely $CLK_{\pm\pi/2}$. At the same time, a *bang-bang* Alexander phase detector compares CLK_0 with the incoming data to indicate whether it is leading or lagging, to control the phase picker to select the proper clock which is in phase with the uplink data. A clock frequency divider (in that case to go from 5 GHz to 2.5 GHz) then drives the RF mixer for SCM down-conversion. Because we are using here a 2-state phase detector, our proof-of-concept receiver will only be able to operate at two different states (in that case $\pm\pi/2$ phase shift). For experimental convenience, a phase shifted version