

Multiplier-based Sources for 3THz and Beyond

T.W. Crowe, S.A. Retzliff, G.S. Schoenthal and J.L. Hesler
Virginia Diodes Inc., Charlottesville, USA (Crowe@vadiodes.com)

Abstract—All-solid-state local oscillators to frequencies as high as 2.7THz have now been demonstrated by two independent research teams [1,2]. These systems offer several microwatts of power with excellent line quality and frequency tunability. This power is suitable to pump the HEB mixers that have been developed by several groups for radio astronomy. The systems are also compact and suitable for use on airborne instruments, such as those being developed for SOFIA. However, the power level is not yet sufficient to pump planned HEB receiver arrays. Furthermore, astronomers desire even higher frequency systems; specifically for measurements of the important atomic oxygen line near 4.7 THz.

This talk will review the status of VDI's development effort for THz sources. Recent results at 2.5, 2.7 and 3.1 THz will be presented and reviewed. This will include discussion of on-going efforts to increase the source power through the use of in-phase waveguide power combining of the lower frequency varactor multipliers. The prospects for generating sufficient power for imaging arrays and the extension of the technology to 4.7 THz will be discussed.

[1]A. Maestrini, I. Mehdi, J. Ward, R. Lin, B. Thomas, C. Lee, J. Gill, G. Chattopadhyay, E. Schlecht, P. Siegel , "A 2.5-2.7 THz room temperature electronic source," Proc. 22nd Intl. Symp. Space Terahertz Technology, Tucson, 26-28 April 2011.

[2]T.W. Crowe, J.L. Hesler, S.A. Retzliff, C. Pouzou, G.S. Schoenthal, "Solid-State LO Sources for Greater than 2THz," Proc. 22nd Intl. Symp. Space Terahertz Technology, Tucson, 26-28 April 2011.