**PPPS 2019** 



Contribution ID: 1039

Type: Poster

## 2P14 - W-band 2D Periodic Lattice Oscillator

Tuesday 25 June 2019 13:00 (1h 30m)

Two dimensional (2D) periodic surface lattices PSLs have been used successfully in both fast-wave sources [1] and in slow-wave sources [2-4]. Numerical simulation codes have been used to design an electron beam driven W-band millimeter-wave source, in which a cylindrical two dimensional (2D) periodic surface lattice (PSL) forms an over-sized mode-selective cavity. The 2D PSL consists of shallow periodic cosinusoidal per-turbations in both the azimuthal and axial directions on the inner wall of a cylindrical waveguide. Electrochemical deposition of copper on a cylindrical aluminum former with the aluminum subsequently removed by dissolving in strong alkali solution was used to construct the 2D PSL. Analytical theory and numerical PIC simulations have been used to design the W-band oscillator that has been constructed. The ratio of the diameter of the cylindrical cross-section of the structure to the operating wavelength is ~5. The performance of oscillator will be compared with the predictions of the numerical simulations.

## ACKNOWLEDGMENT

Support from AFOSR under awards FA8555-13-1-2132 and FA9550-17-1-0095 is gratefully acknowledged.

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**Session Classification:** Poster - Microwave Generation and Plasma Interactions and Pulsed Power Switches and Components

Track Classification: 2.3 Slow-Wave Devices