



Contribution ID: 211

Type: Poster

An all circular waveguide four-way power combiner with ultra high power capacity and high combination efficiency

Monday 19 June 2017 13:30 (1h 30m)

Abstract: The two-way power combiner consisting of two TM₀₁-TE₁₁ serpentine mode converters with a common output has demonstrated high power capacity and high combination efficiency for two phase-locked relativistic backward wave oscillators (RBWOs) [1]. To realize channel power combination for four phase-locked X-band RBWOs, we propose an all circular waveguide four-way power combiner based on the previous two-way power combiner. Four TM₀₁ modes are first combined into two TE₁₁ modes, then through two separate 90° bending waveguide and the radius enhanced transition waveguides, the two TE₁₁ modes is combined into one TE₁₁ mode. The transmission efficiencies of 90° bending waveguide and radius enhanced transition waveguides, and the combination efficiency of the two TE₁₁ modes into one TE₁₁ mode are larger than 99%. The maximum electric field is less than 750 kV/cm as the power in the common output port is 10 GW, and the total combination efficiency is more than 90%.

[1] R. Z. Xiao, Y. Q. Deng, Y. Wang, Z. M. Song, J. W. Li, J. Sun, and C. H. Chen, Power combiner with high power capacity and high combination efficiency for two phase-locked relativistic backward wave oscillators. Appl. Phys. Lett. 107, 133502, 2015.

Authors: CHEN, Changhua; DENG, Yuqun; LI, Jiawei; LIANG, Tiezhu; SONG, Zhimin; SUN, Jun; Dr XIAO, Renzhen (Northwest Institute of Nuclear Technology)

Presenter: Dr XIAO, Renzhen (Northwest Institute of Nuclear Technology)

Session Classification: Poster session I - High Power Microwaves, RF Sources and Antennas

Track Classification: High Power Microwaves, RF Sources and Antennas