

Development of S-band high efficiency klystron

This paper focuses on designing S-band klystrons with higher efficiency to reduce energy consumption and costs in particle accelerators. Two novel bunching methods, Core Oscillation Method (COM) and Bunching Alignment and Collecting (BAC), have been applied to the S-band klystron at the Beijing Electron Positron Collider II (BEPCII). These methods have increased the klystron's efficiency from 45% to 55% and its output power to 80 MW. The design has been optimized using 1-D, 2-D, and 3-D simulation codes, which have improved electron injection and RF conversion efficiency. This design aligns with the goal of reducing energy consumption and promoting environmental sustainability.

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