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Studies of operation and control of CW magnetrons for HEP and ADS accelerators

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CW magnetrons designed and optimized for industrial heaters, driven by an injection-locking signal, were suggested to power Superconducting RF (SRF) cavities. However, CW magnetrons are regenerative devices that apply some of their output back to its input to add to the input signal, increasing the gain/amplification. To avoid large regenerative instability in operation, we propose a new approach to operation and control of CW magnetrons considering non-stationary processes during start-up and operation that makes it possible to find a mode of almost coherent RF generation of tubes with a significant reduction in regenerative instability and noise and increased efficiency.

Footnotes

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