KSTAR ECH GYROTRON TEST SYSTEM

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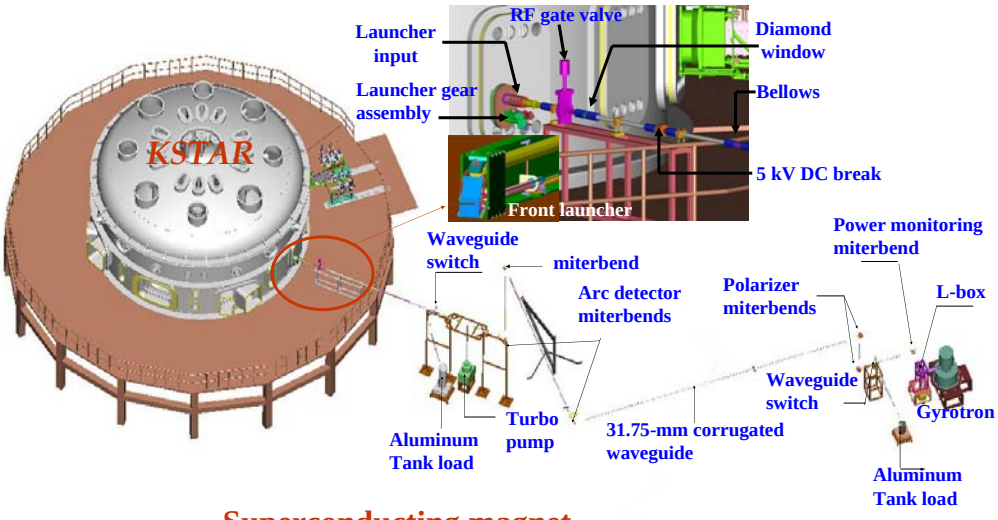
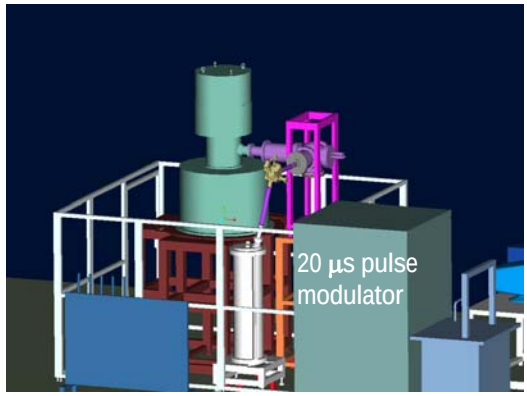
Objectives of 84 GHz, 500 kW ECH System for KSTAR Tokamak

- Pre-ionization and start-up assist
  - ECH pre-ionization can reduce the loop voltage for ohmic breakdown and save the magnetic flux loss[volt-sec] of OH by causing prompt breakdown after PF current initiation
  - ECH start-up is not sensitive to the variation of stray field strength (insensitive to tolerance of field error, prefill pressure variation, and impurity concentration)
- Heating
  - supply auxiliary power to heat the KSTAR plasma
- Plasma Control (upgrade phase: ECCD with > 1 MW)
  - pressure profiles of plasma and performance optimization
  - drives non-inductive current for MHD stabilization and steady-state operation

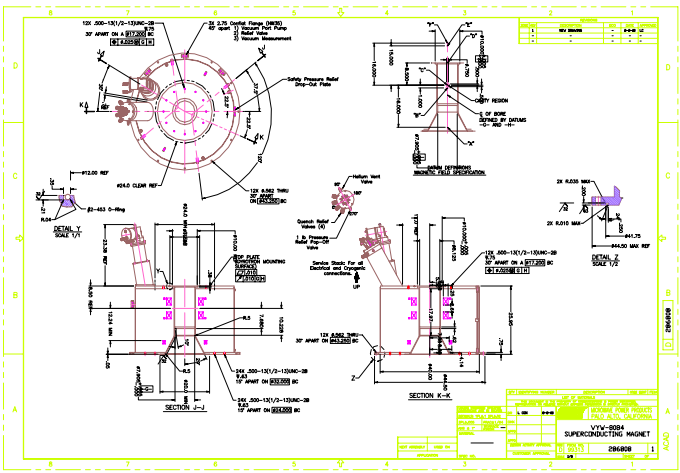
KSTAR ECH System



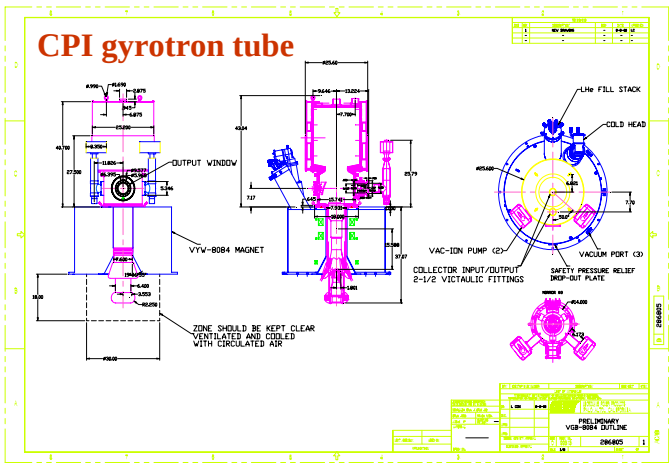
Short Pulse Test Setup



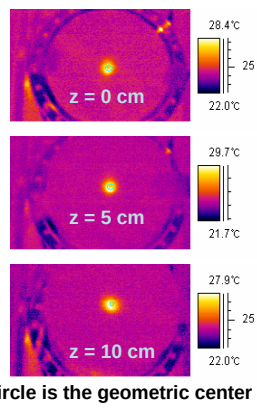
Superconducting magnet



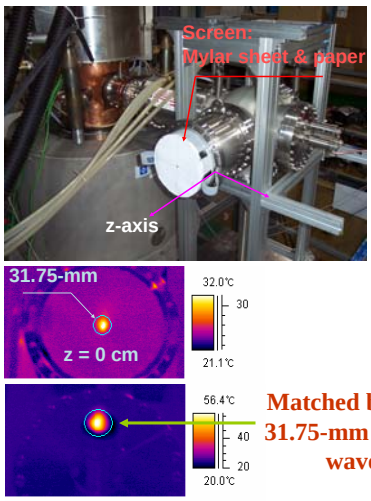
CPI gyrotron tube



Focusing and Matching using IR camera

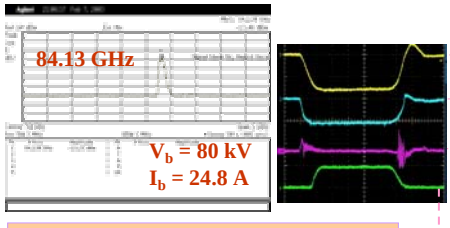


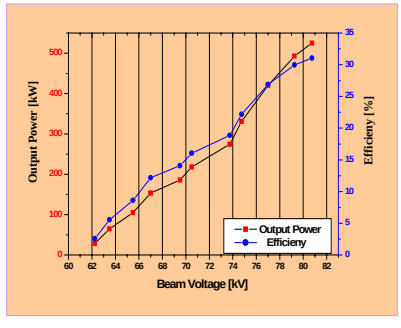
Circle is the geometric center



Matched beam into a 31.75-mm corrugated waveguide

Freq. & Power Meaurements





HV circuit & signals