RF Power Sources for the ILC

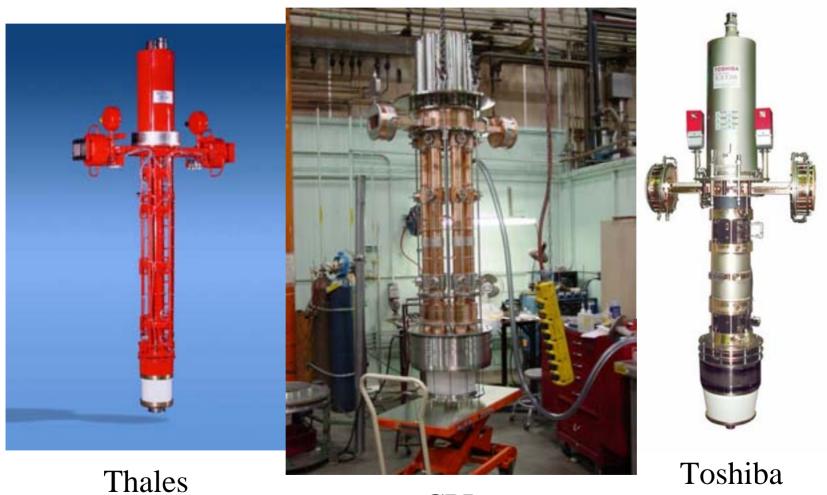
S. Choroba, DESY

Requirements

- 10MW, 1.5ms, 5Hz as in TESLA TDR
- What is available or almost available today? MBKs with 10MW, 1.5ms, 10Hz at 115kV and 135A

What could be done in addition?
Sources with same parameter as MBK or sources with different parameter might be considered

Available 10MW MBKs



CPI

Status of the 10MW MBKs

- Thales: 4 Tubes produced, arcing problem seems to be solved, more tubes are in production
- CPI: Prototype factory tested, now for acceptance test at DESY
- Toshiba: Prototype reached 10MW, 1ms, 10Hz
- Horizontal 10MW MBK soon

Alternatives to be considered

5MW HOM IOT

10MW SBK

Parameters similar to 10MW MBK



Peak Output Power	5	MW (min)
Average Output Power	75	kW (min)
Beam Voltage	115	kV (nom)
Beam Current	62	A (nom)
Current per Beam	5.17	A (nom)
Number of Beams	12	
Frequency	1300	MHz
1dB Bandwidth	4	MHz (min)
Gain	22	dB (min)
Efficiency	70	% (nom)
Solenoid Power	1	kW
Cathode Loading	1.0<	A/cm ²



LV 10MW MBK

Voltage e.g. 65kV Current 238A More beams

Summary

- 10MW MBKs from 3 different vendors are available or almost available, horizontal versions must be constructed and built and will be used for the XFEL
- 10 MW SBK might be an additional source
- IOTs and LV MBKs require other modulators as 10MW MBKs
- The development of a new type of high power RF source always requires several years
- 10MW MBKs should be chosen as sources for baseline, alternatives could be developed if enough resources are available to make the 10MW MBKs cheap, reliable, high efficient etc.