

HLRF meeting

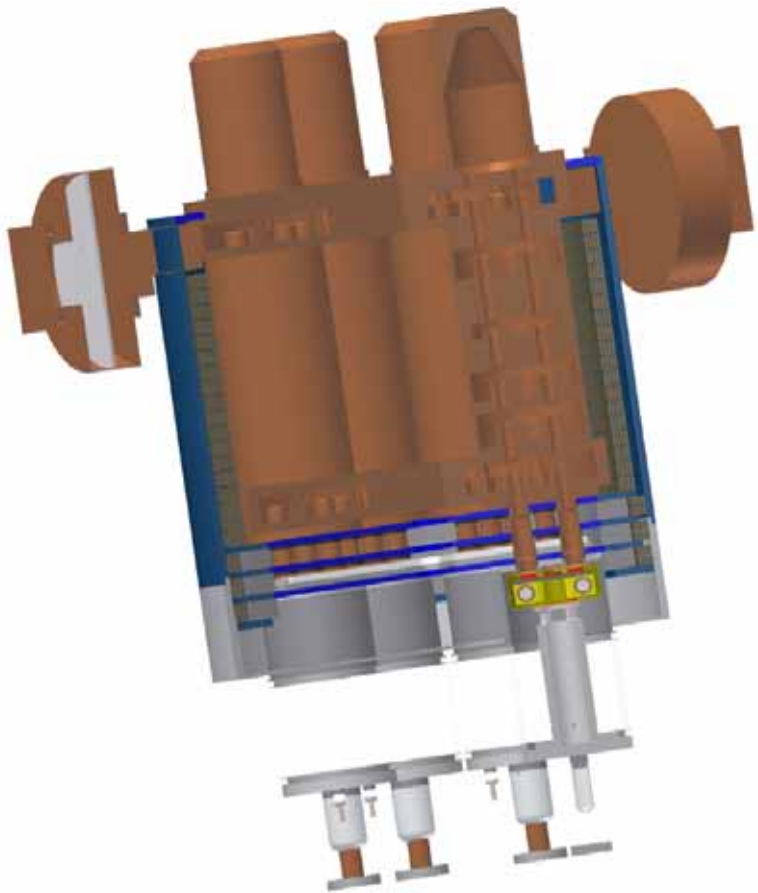
- 36-Beamlets Klystron Plan In KEK

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Multi Beam Klystron Plan for ILC in KEK

$$\frac{50 \text{ kV} \times 8.5 \text{ A} \times 65\%}{\mu P=0.75} = 276 \text{ kW / beamlet} \\ \times 36 \text{ beamlets} = 10 \text{ MW}$$



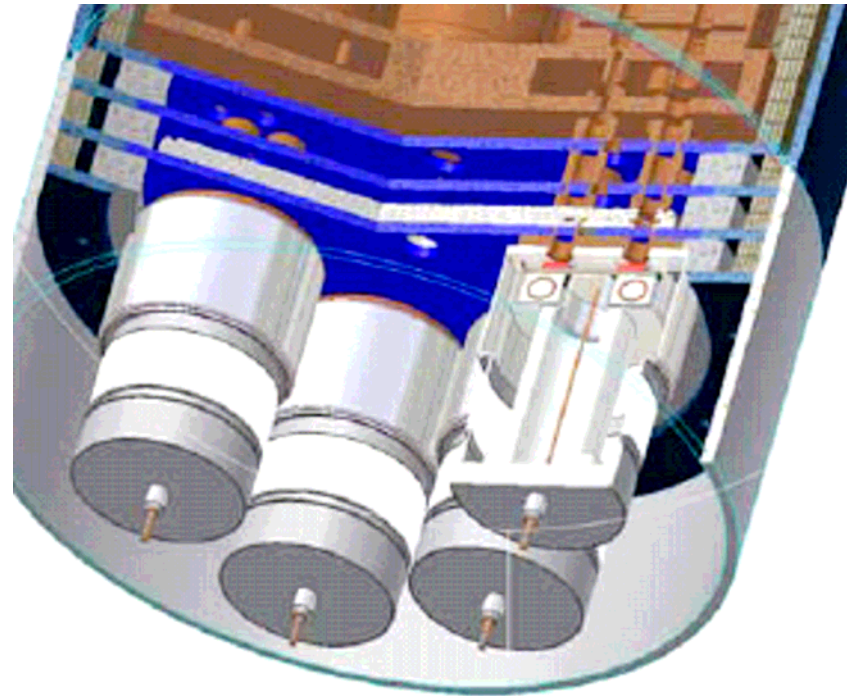
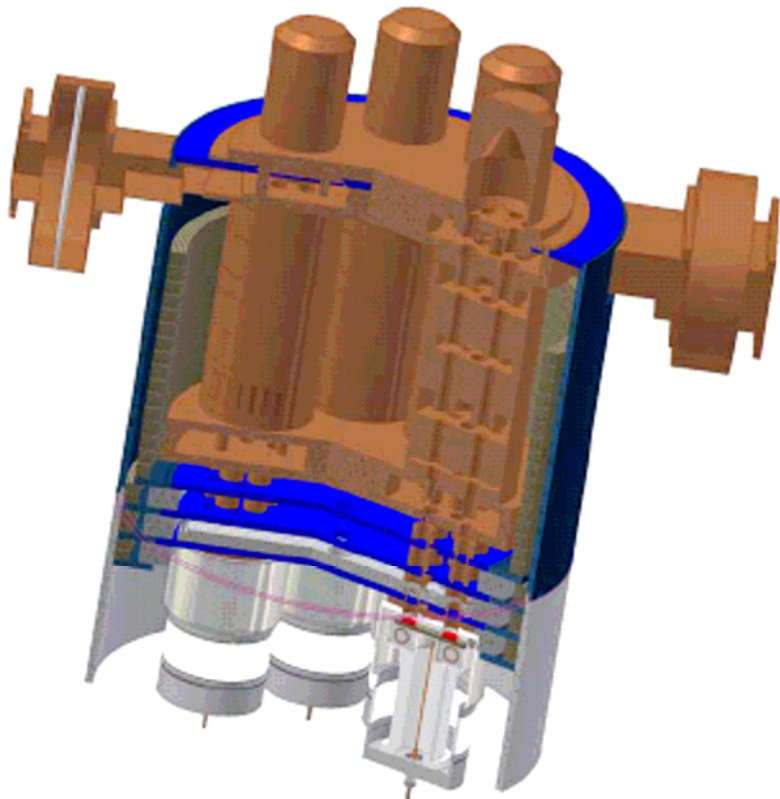
The operating voltage of 50 kV gives us as following merits:

- Elimination of the pulse transformer.
- Elimination of the klystron oil tank.

Further this barrel shape can provide:

- No need to mount it in horizontally.
- Benefit for WG layout and installation.

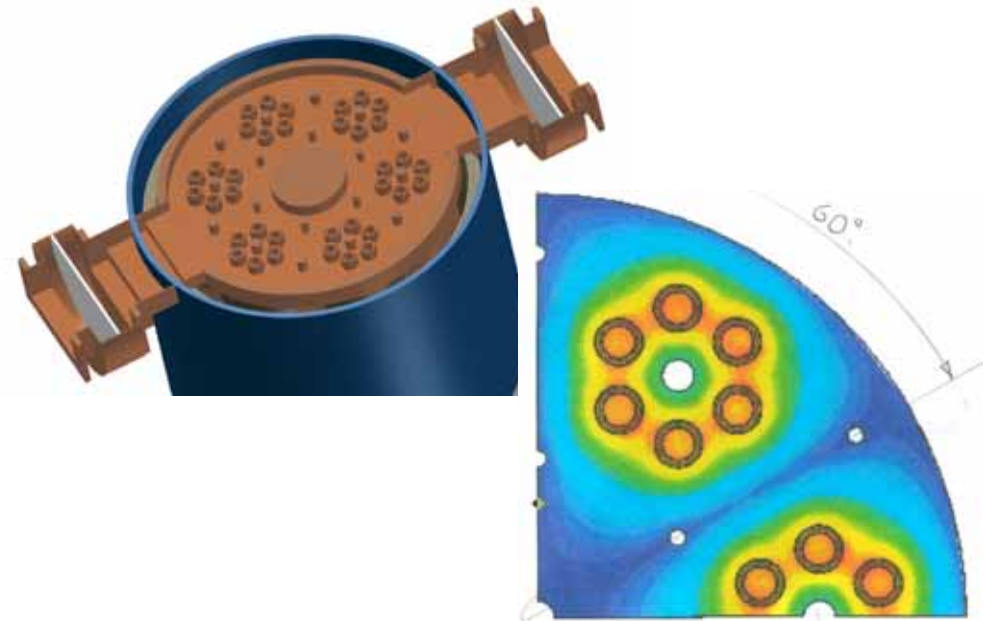
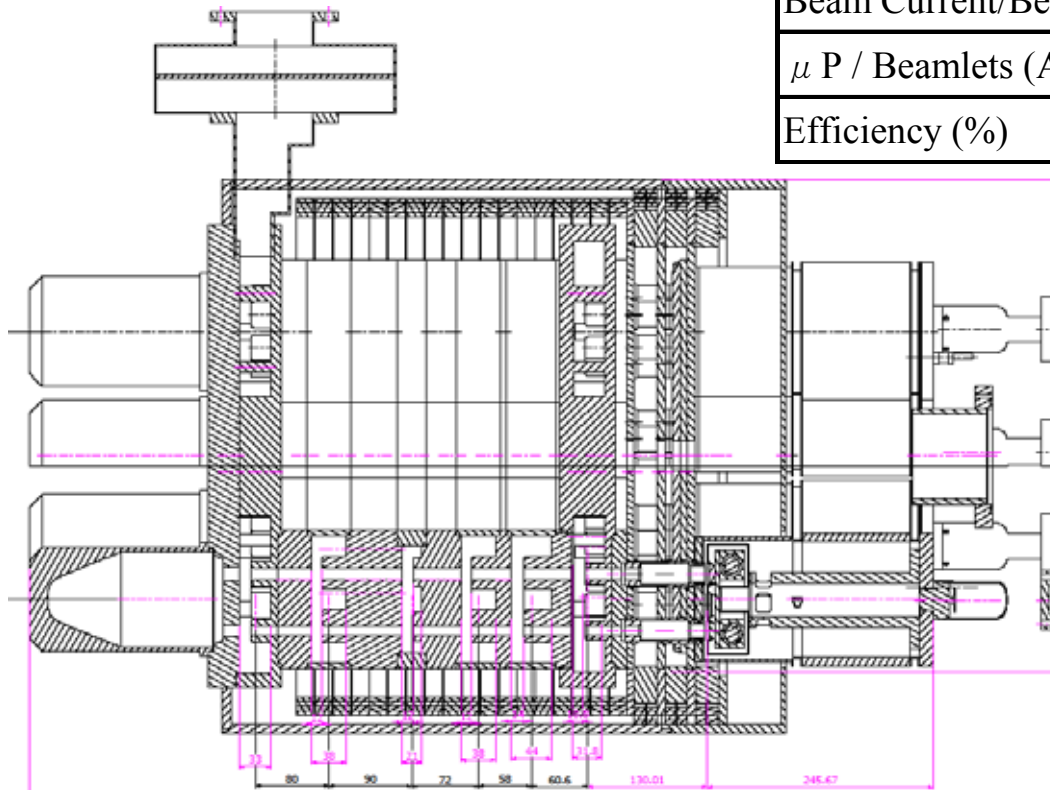
36-beamlet MBK



Input and output cavities are common with all beam-lets, While intermediate cavities are independent with one sixth Beams. Six beam-lets has a common filament assembly. Harmonics cavity is introduced.

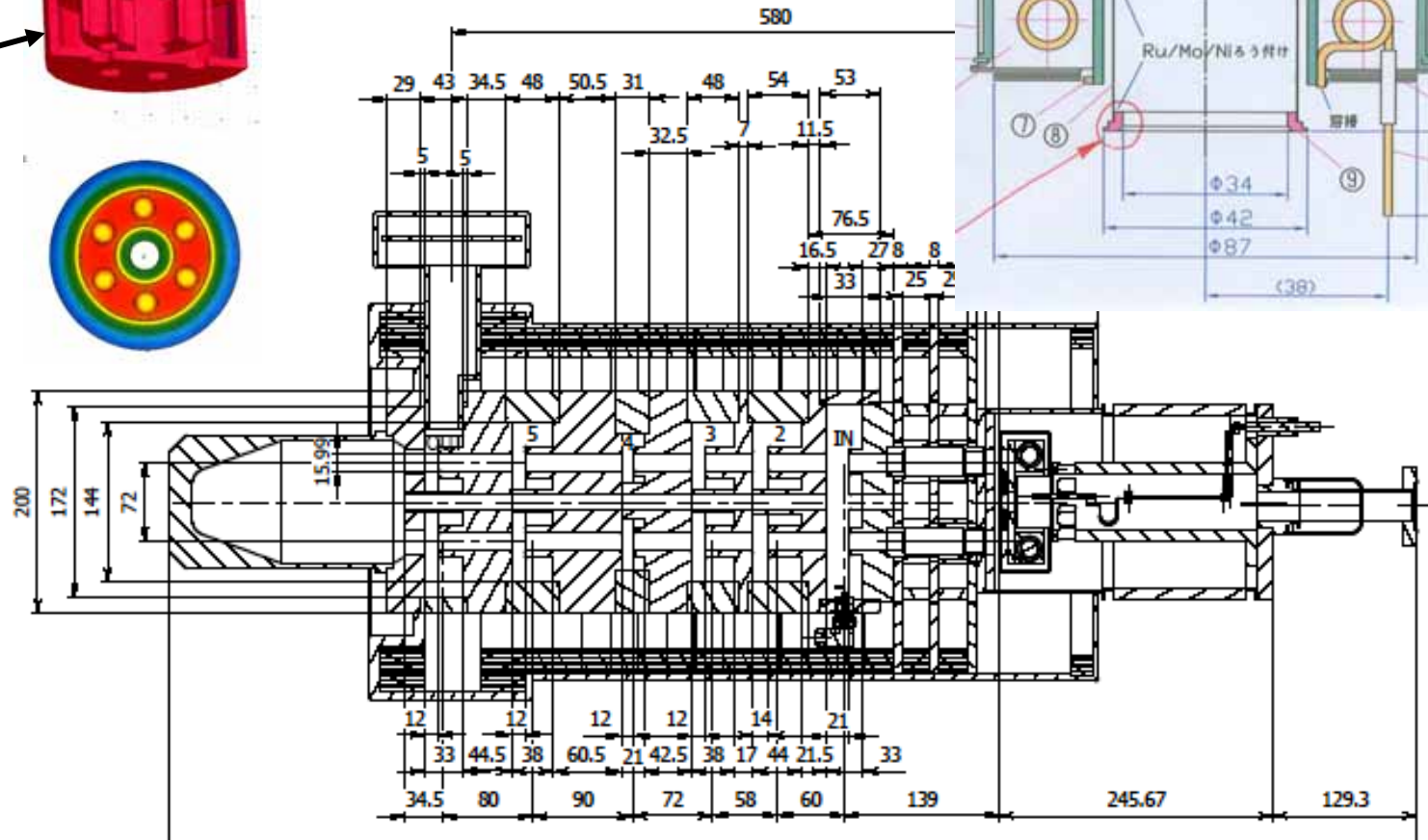
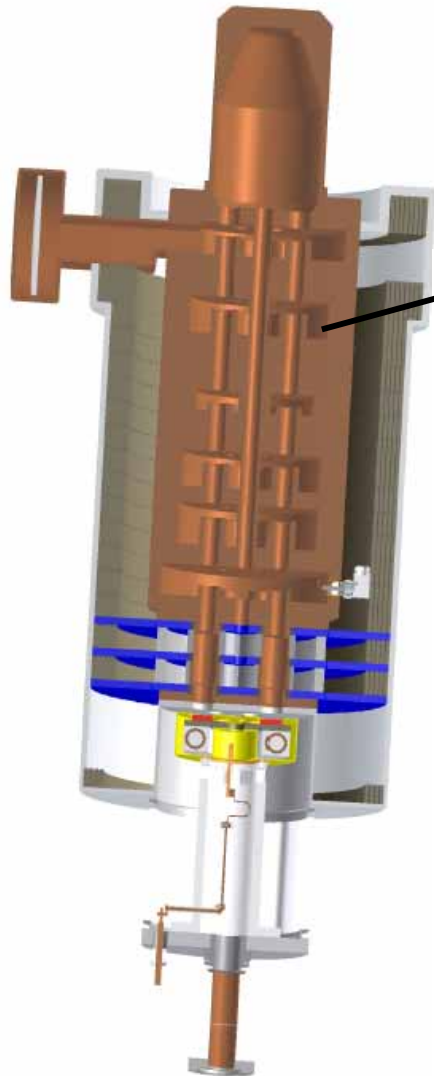
Drawing and Parameter of 36-beamlets MBK

Parameter	Value				
Output Power (MW)	5	10	10	10	10
Beam Voltage (kV)	125	117	70	60	50
Beam Current (A)	86	130	300	300	300
Number of Beams	1	7	18	24	36
Beam Current/Beamlets (A)	86.00	18.57	16.67	12.50	8.33
μP / Beamlets (A)	1.95	0.46	0.90	0.85	0.75
Efficiency (%)	46.5	65.7	47.6	55.6	66.7

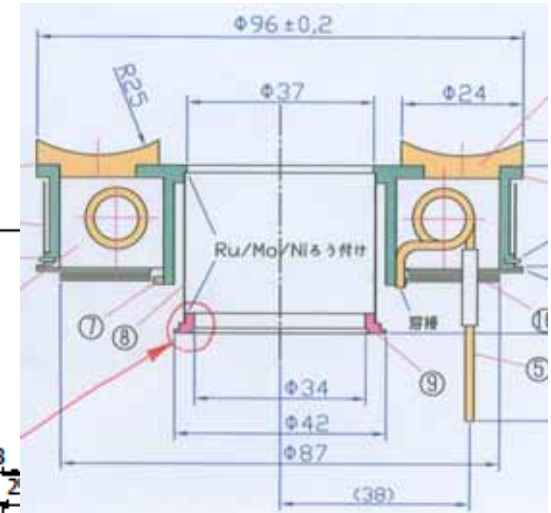


6-beamlet MBK for Step-by-step Development

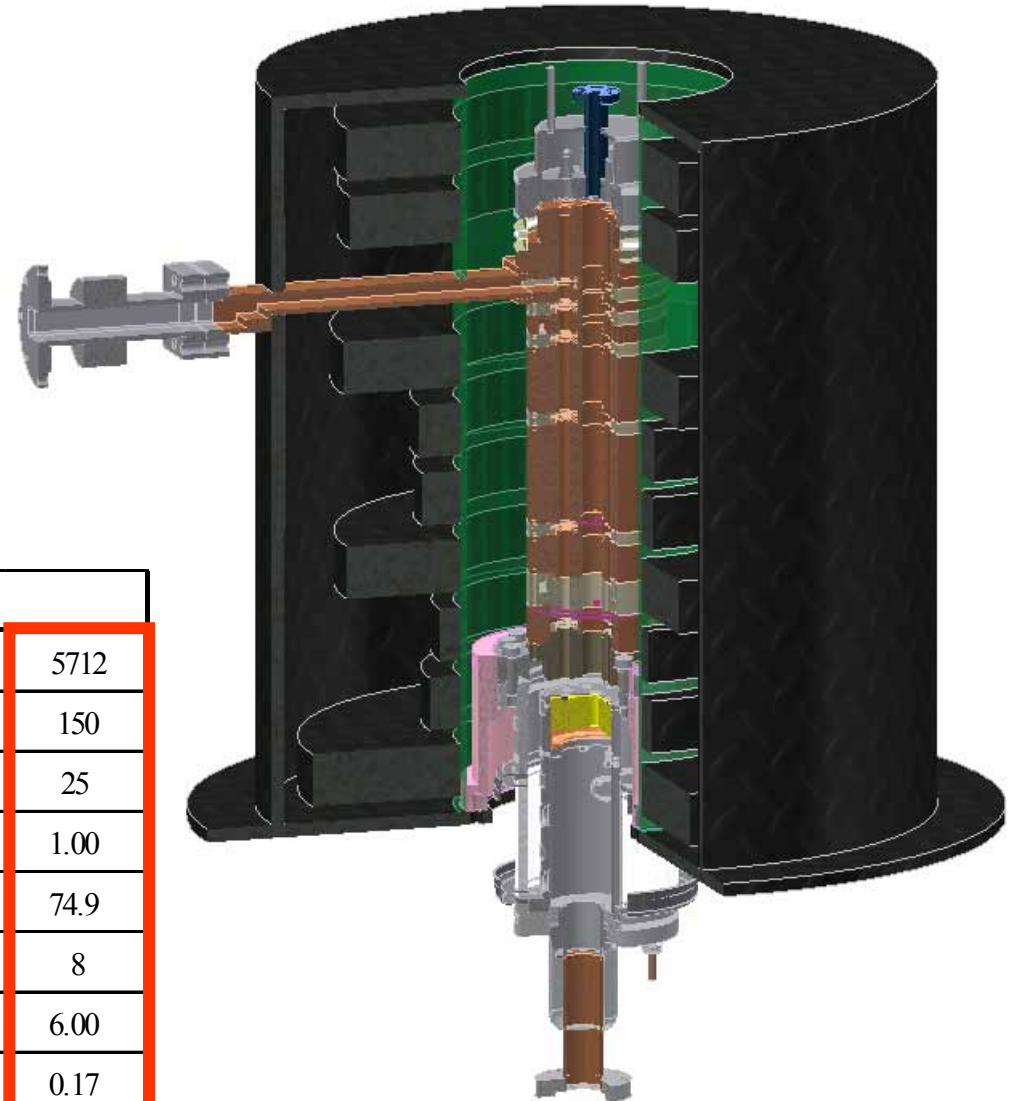
2 MW 6-beamlet MBK
(1/6 of 36-beamlet MBK)



Cathode



C-band Sub-booster MBK for Excesize



Parameter	Value				
Frequency (MHz)	5712	5712	5712	5712	5712
Output Power (kW)	80	150	150	150	150
Beam Voltage (kV)	25	25	25	25	25
Beam Current (A)	7.88	6.11	2.17	1.37	1.00
Efficiency (%)	40.4	49.1	69.0	73.1	74.9
Number of Beams	1	2	4	6	8
Cathode Loading (A/cm ²)	6.00	6.00	6.00	6.00	6.00
Cathode Area (cm ²)	1.31	1.02	0.36	0.23	0.17

Action Plan

- **C-band MBK will be manufactured in 2007.**
- **Design of the 36-beamlets klystron is almost finished.**
(Designed by V. Teryaev BINP)
- **First step is to manufacture one sixth part of the tube.**