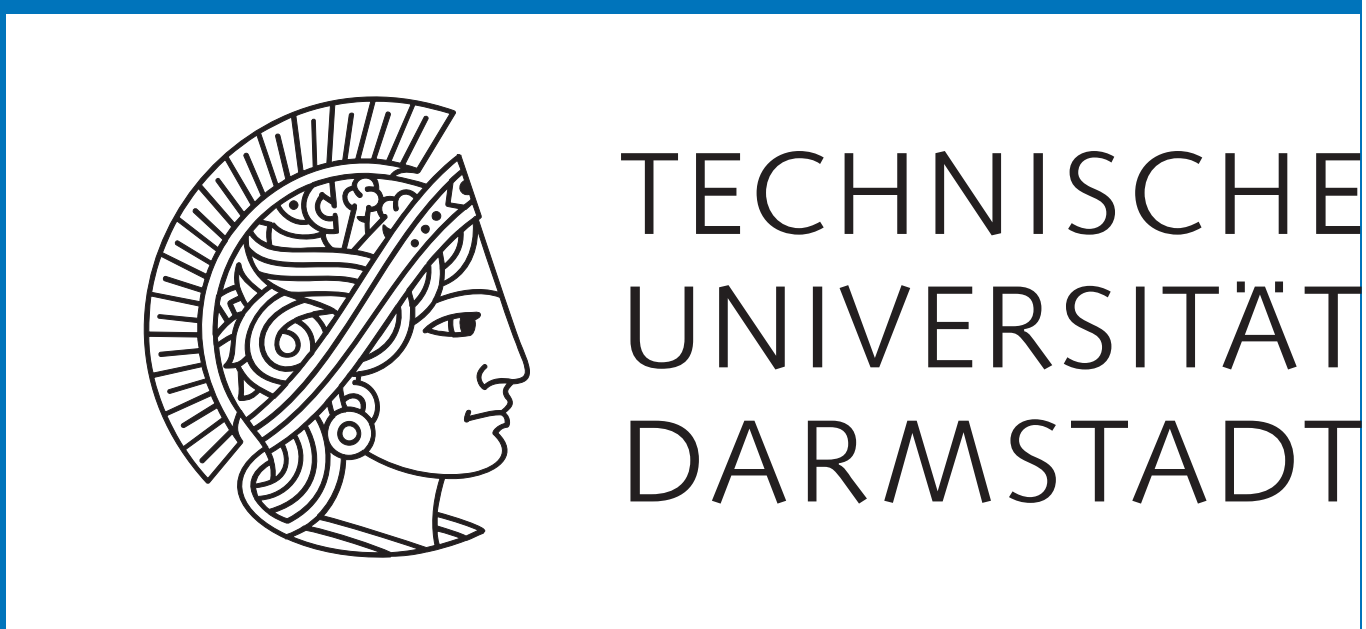


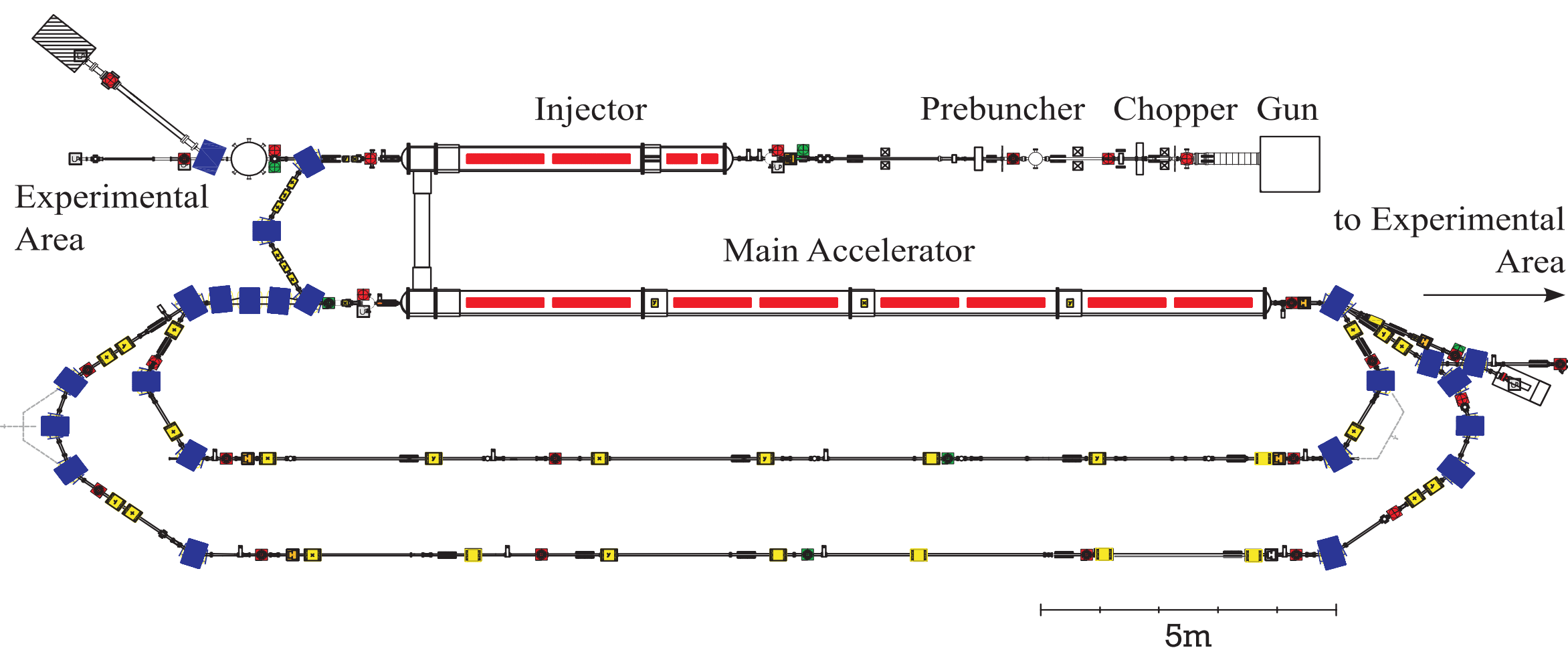
Cold leak problems related to HELICOFLEX Gaskets and recent results from the S-DALINAC*

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*Work supported by DFG through SFB 634



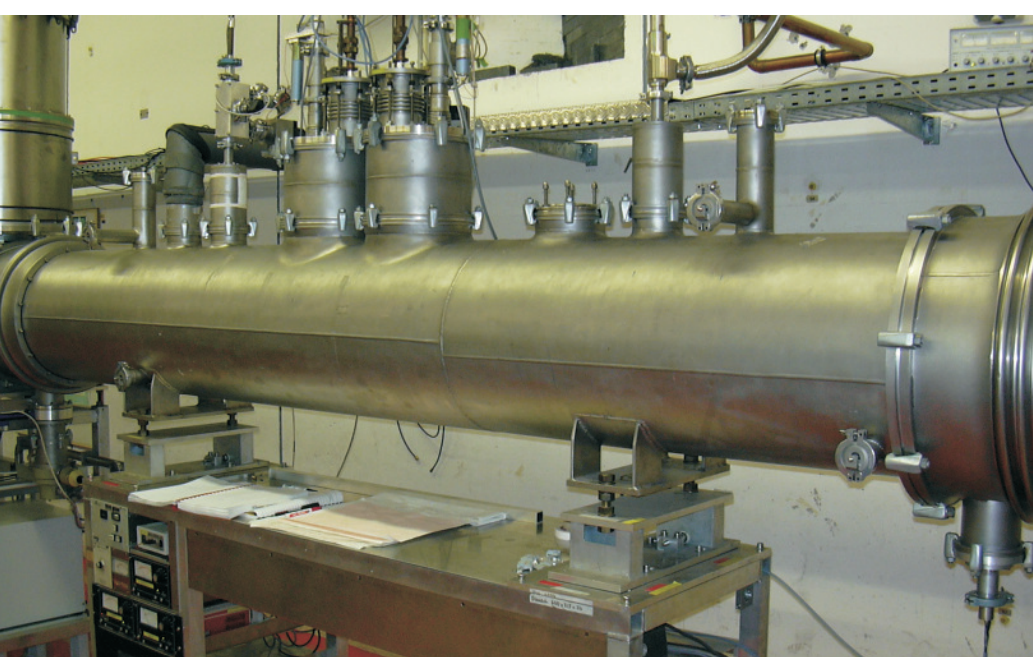
S-DALINAC



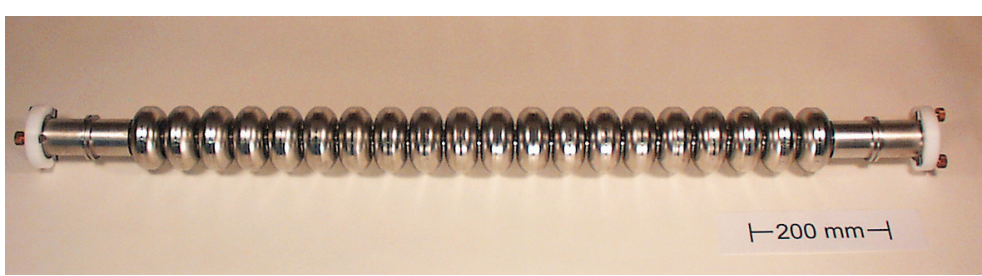
First operation in 1987

Temperature: 2 K
Frequency: 3 GHz
Duty cycle: cw
Design energy: 130 MeV
Max. beam current: 60 μ A

Cryo-module



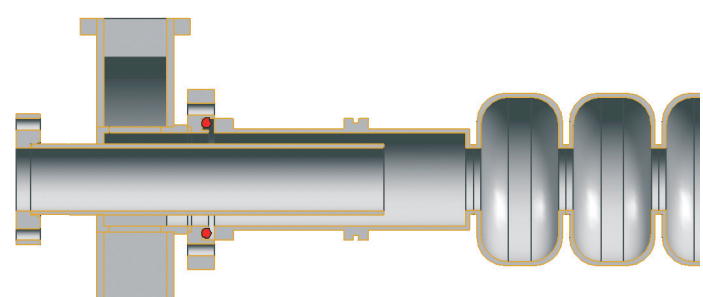
Cavity



Length: 1 m
Number of cells: 20
Acc. field: 5 MV

Cold leak problems

During the last two years, operation of the S-DALINAC suffered severely from cold leaks: They were hard to locate, sometimes vanished without any obvious reason or showed up again depending on the thermocycle. Finally the gaskets sealing the cavity against the helium reservoir were found to be the reason for this behaviour.

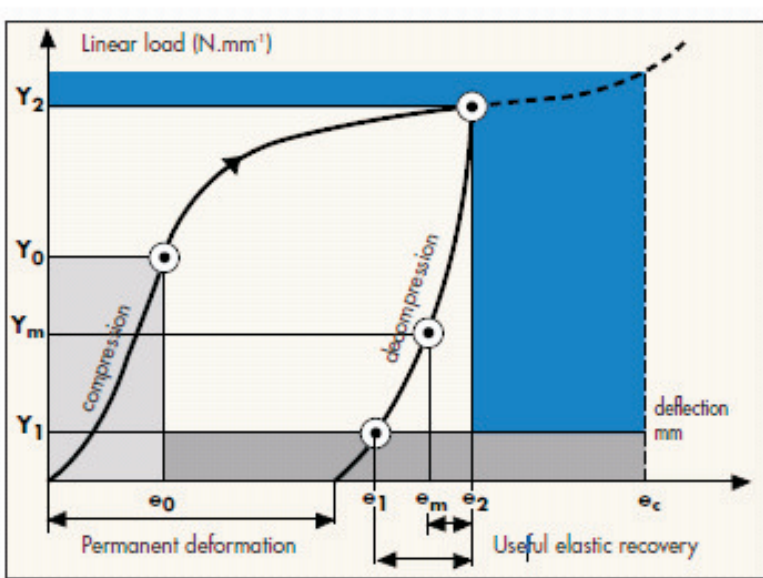


HELICOFLEX®

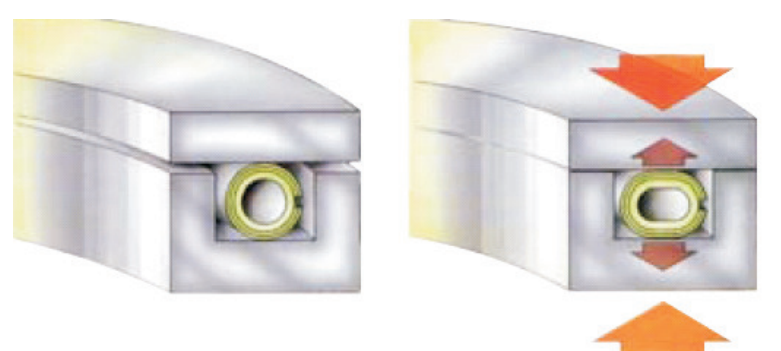
Old Gaskets:
HN 100-15033, d = 4.5 mm

replaced by

New Gaskets:
HN 200, d = 4.7 mm

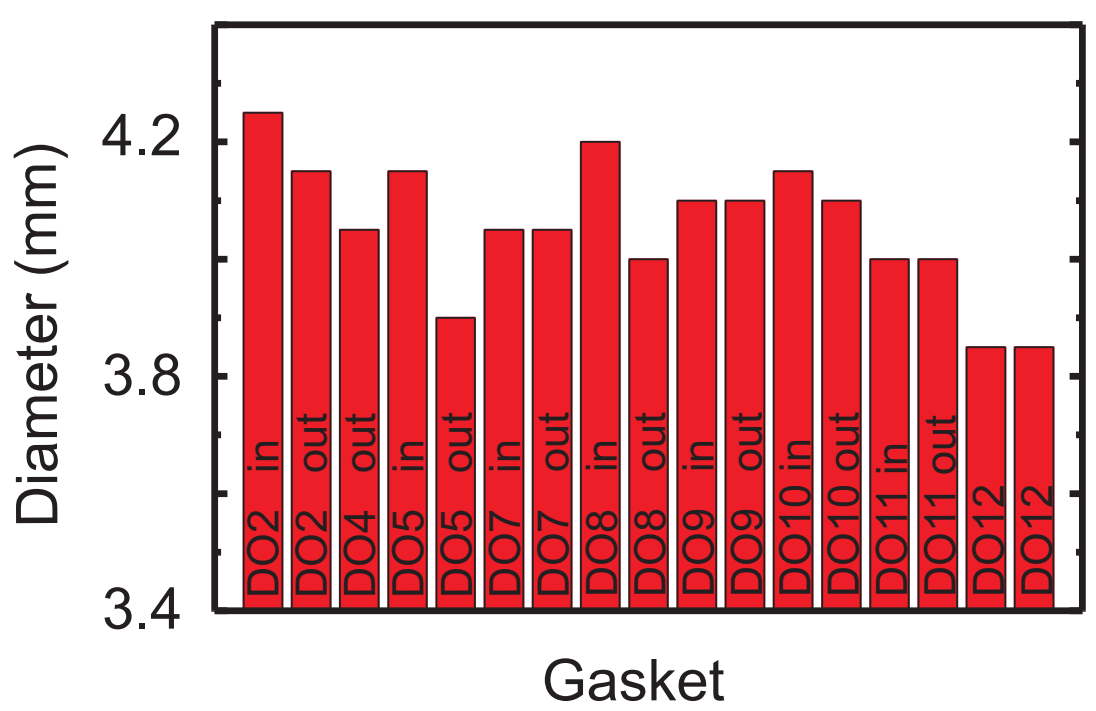


Compressed by (1 ± 0.1) mm for leak-tightness

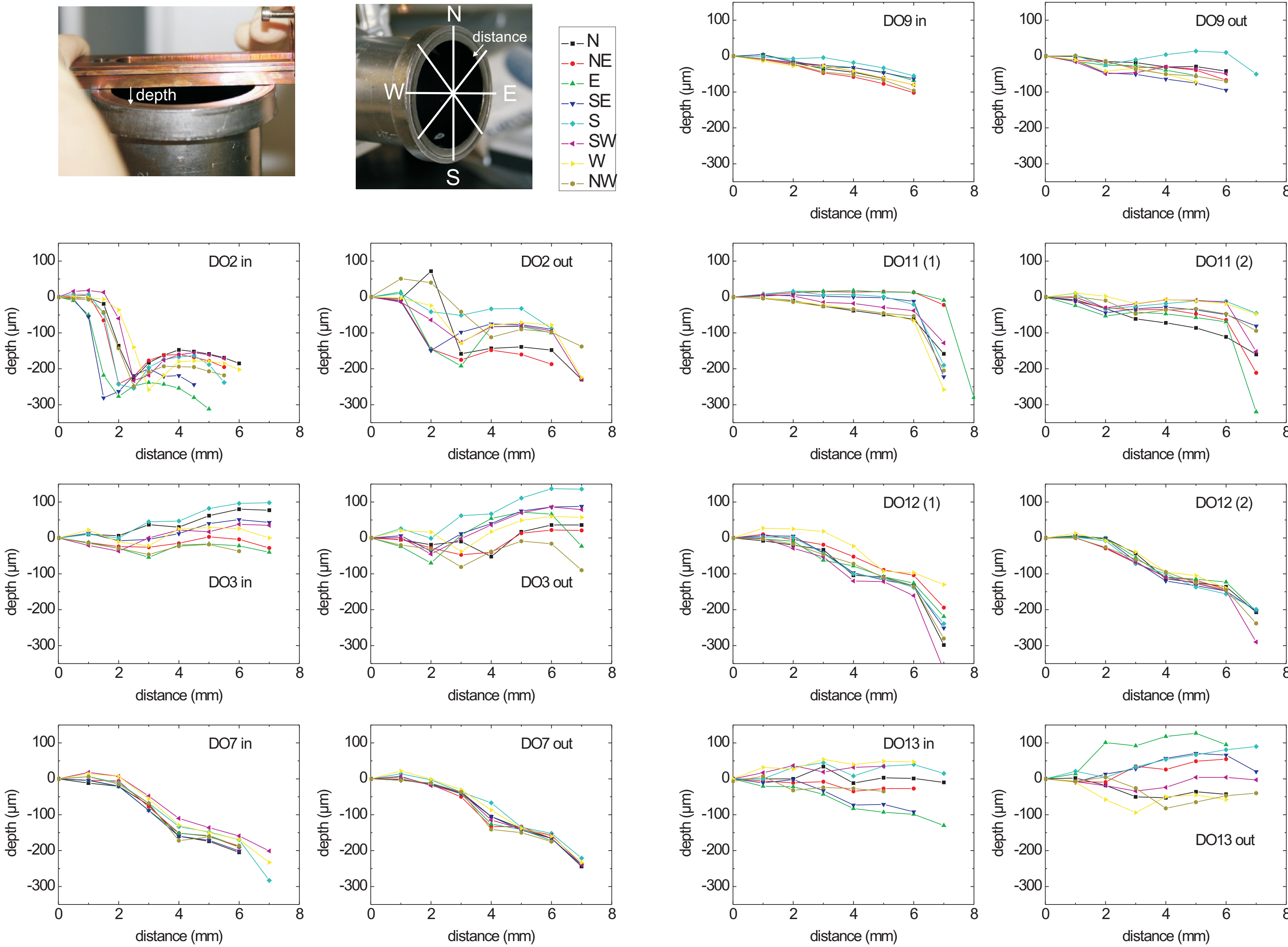
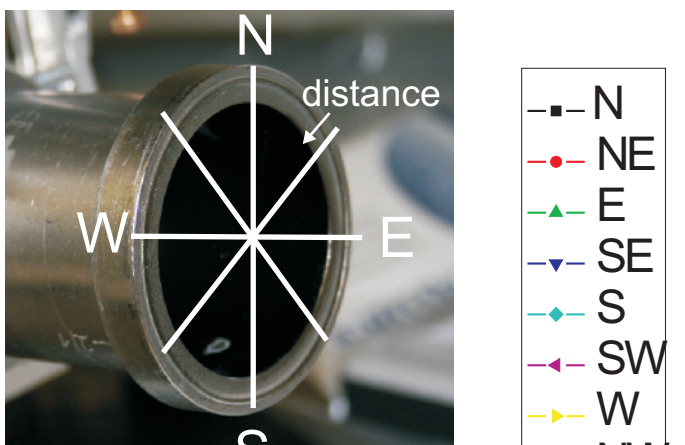
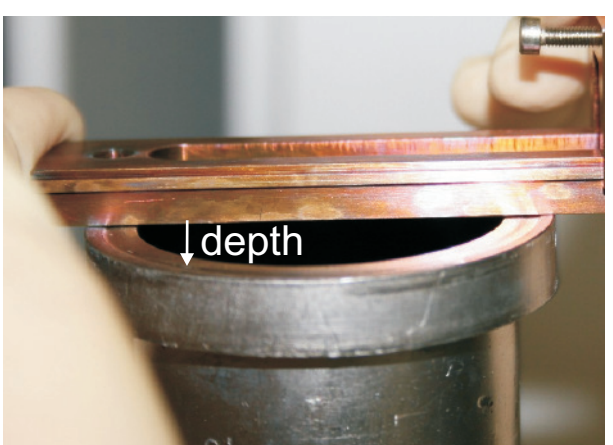


Measurement of gasket diameter after disassembly

Cavity	old Gasket (mm)	new Gasket (mm)
DO2 in	4.2 - 4.3	4.5 - 4.6
DO2 out	4.1 - 4.2	4.4 - 4.5
DO4 out	4.0 - 4.1	4.2 - 4.4
DO5 in	4.1 - 4.2	4.6 - 4.7
DO5 out	4.1 - 4.2	4.4 - 4.5
DO7 in	3.8 - 4.0	
DO7 out	4.0 - 4.1	4.1 - 4.2
DO8 in	4.0 - 4.1	
DO8 out	4.2	
DO9 in	3.9 - 4.1	4.2 - 4.4
DO9 out	4.1	4.4 - 4.5
DO10 in	4.1 - 4.2	4.4 - 4.6
DO10 out	4.1	
DO11 in	3.9 - 4.1	
DO11 out	3.9 - 4.1	
DO12	3.8 - 3.9	

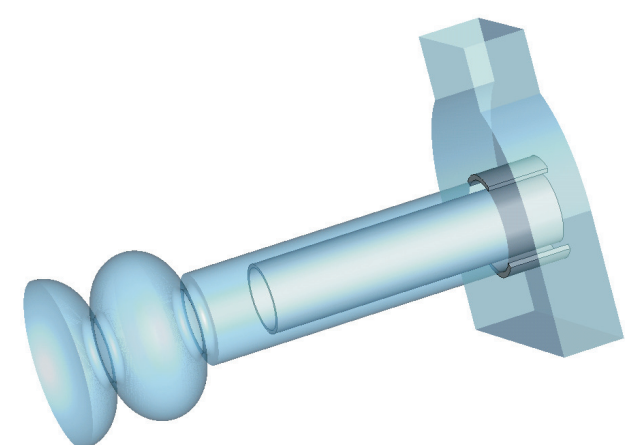


Measurement of the niobium flange surface of several cavities



New cryostat design

	Current design	New design
Energy	10 MeV	14 MeV
Current	60 μ A	150-250 μ A
RF coupler	coax-to-coax	waveguide-to-coax
RF trans. line	coaxial (21 mm)	waveguide (WR-284)
Max. power	500 W	2000 W



Static heat losses < 5 W

Waveguide RF losses < 200 mW

