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# WG5: HOM Couplers and Beam Line Absorbers

## Absorbers

*T. Higo, KEK*

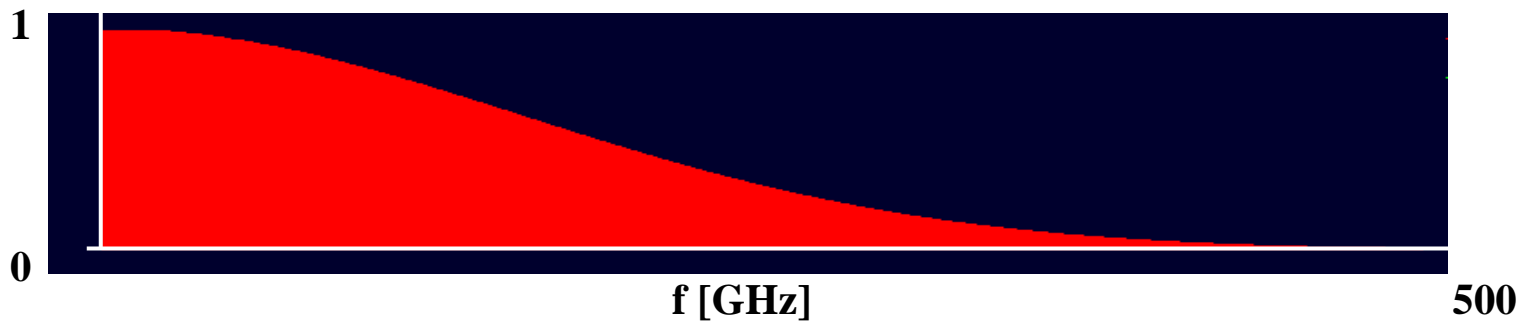
*M. Liepe, Cornell*

*S. Noguchi, KEK*

*J. Sekutowicz, DESY*

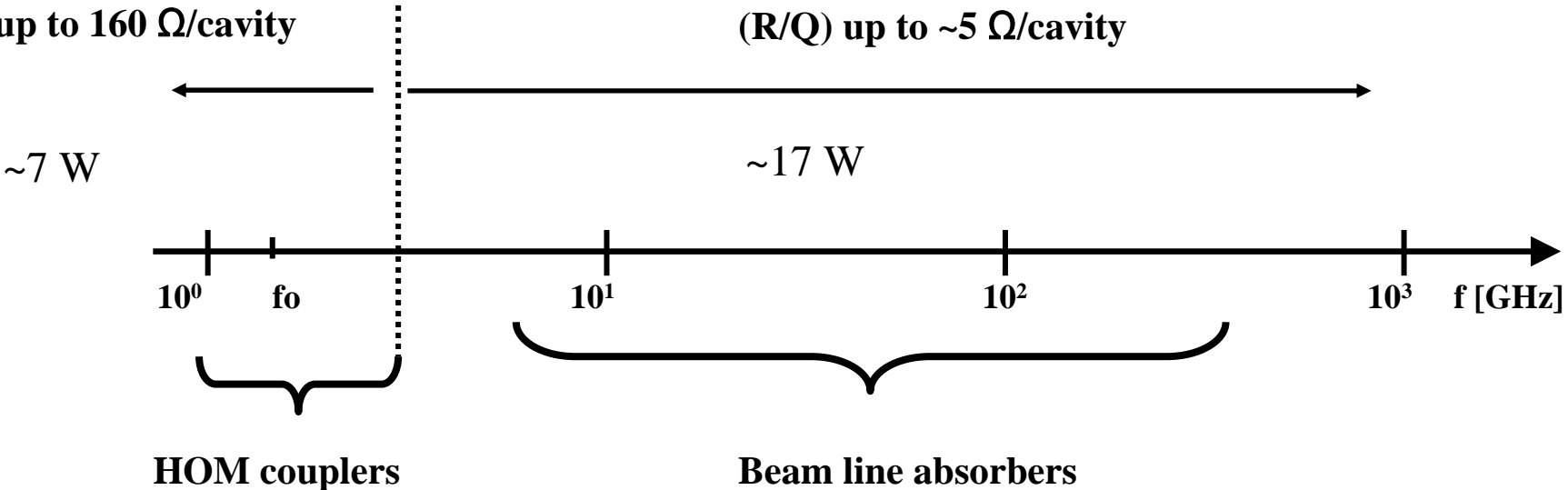
# General Requirements

Beam spectrum: 3.2 nC,  $\sigma_z = 0.300$  mm,  $\Delta f_{i,i+1} = 2.967$  MHz



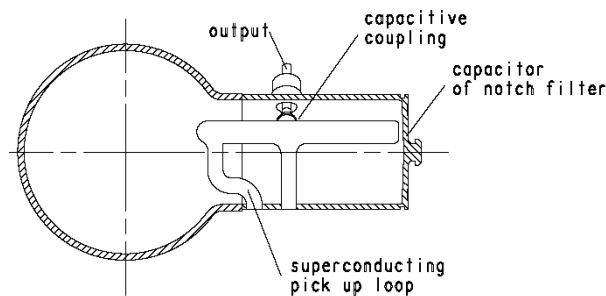
Modes below cut-off,  
(R/Q) up to 160  $\Omega$ /cavity

Propagating modes,  
(R/Q) up to  $\sim 5$   $\Omega$ /cavity



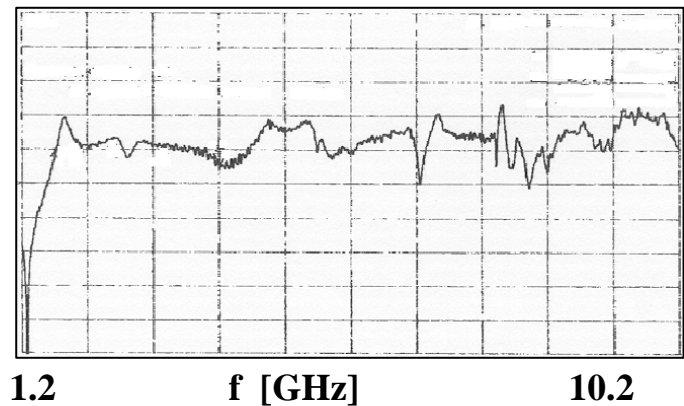
# BCD: HOM couplers and Beam Line Absorbers

2xHOM couplers/cavity (HOMs below cut-off).

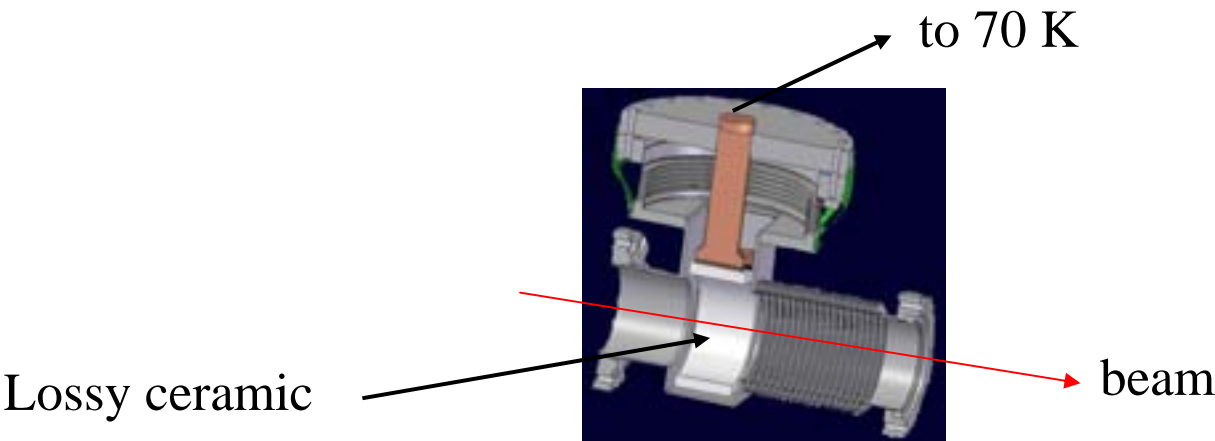


Transfer function

A.U.



1xBLA/cryomodule (HOMs above cut-off).



## HOMs below cut-off

The scheme proposed in TESLA TDR based on two coaxial HOM couplers with couplers with the recently proposed improvement (mirrored coupler).  
coupler).

## Propagating HOMs

70 K Beam Line Absorber which is under development for XFEL.

### *pros:*

This damping scheme was proven at TTF linac and fulfills the spec for major part spec for major part of non propagating modes.

Synergy with scheme proposed for XFEL

### *cons:*

It makes end-groups expensive

### 1. R&D program towards reducing costs of HOM couplers

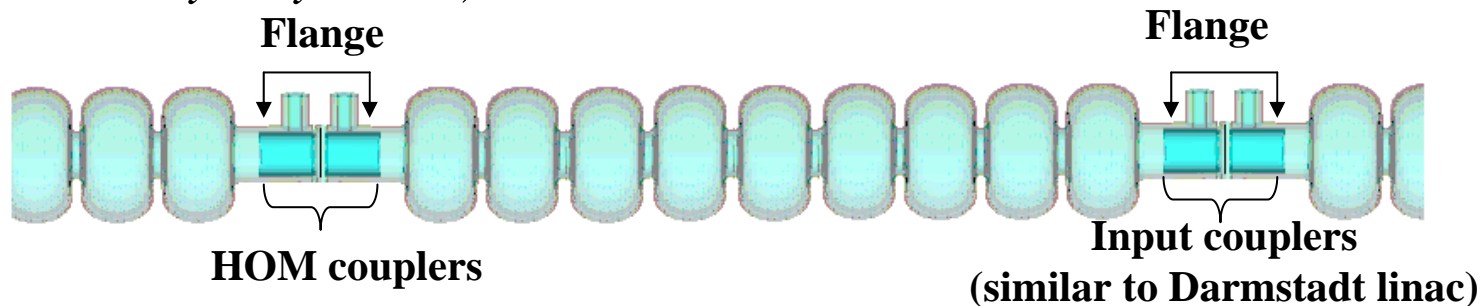
- ➡ Positioning of the HOM coupler output in the plane of the coupling loop.
- ➡ Version of HOM coupler without output capacitor.
- ➡ HOM with one inductance (proposed by KEK).

**pros:** If works we can lower the cost

**cons:** Performance must be verified with the beam

### 2. Beam line coaxial HOM coupler for non propagating modes

(see Nikolay Solyak talk).



**pros:** Cavity is cylindrically symmetric and easy for hydroforming

**cons:** Potential problems with tilted field profiles of HOMs