# WG5: HOM Couplers and Beam Line Absorbers Absorbers

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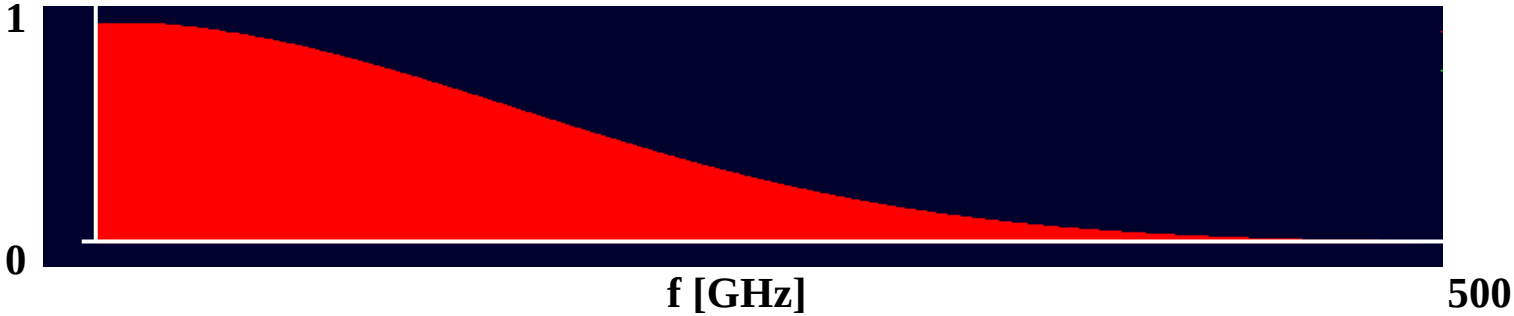
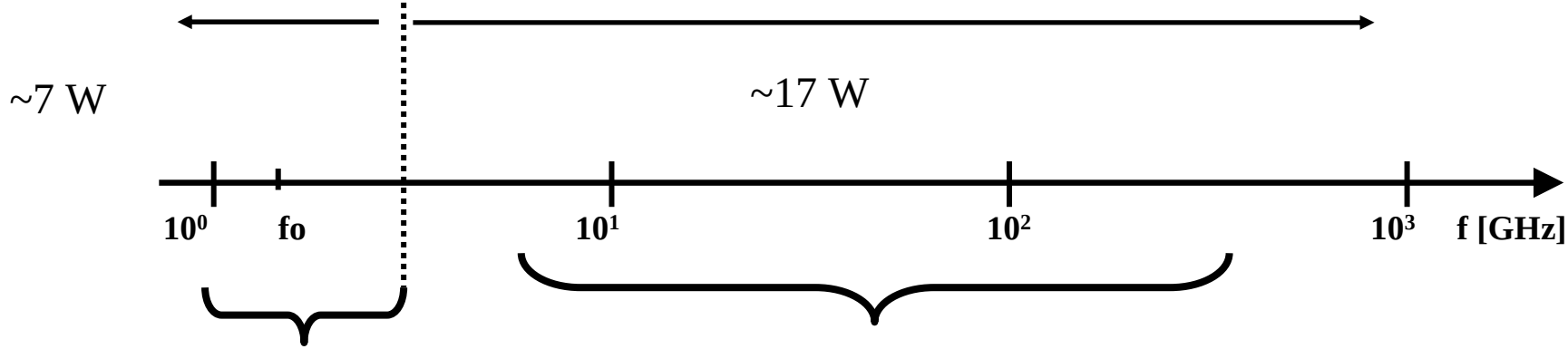
# General Requirements

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

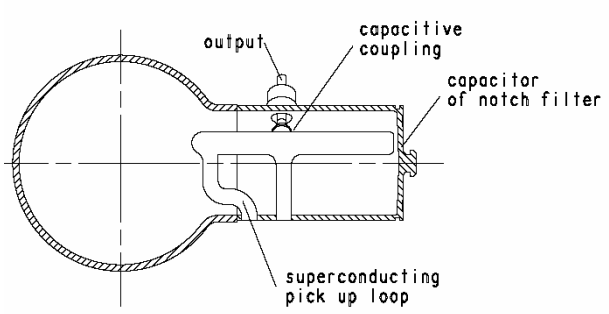



**Modes below cut-off,**
**(R/Q) up to 160 Ω/cavity**

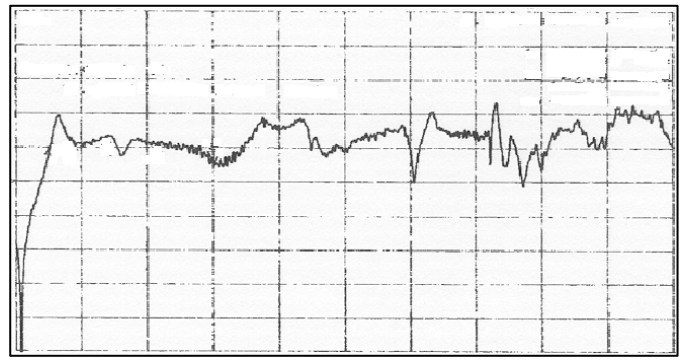
**Propagating modes,**
**(R/Q) up to ~5 Ω/cavity**



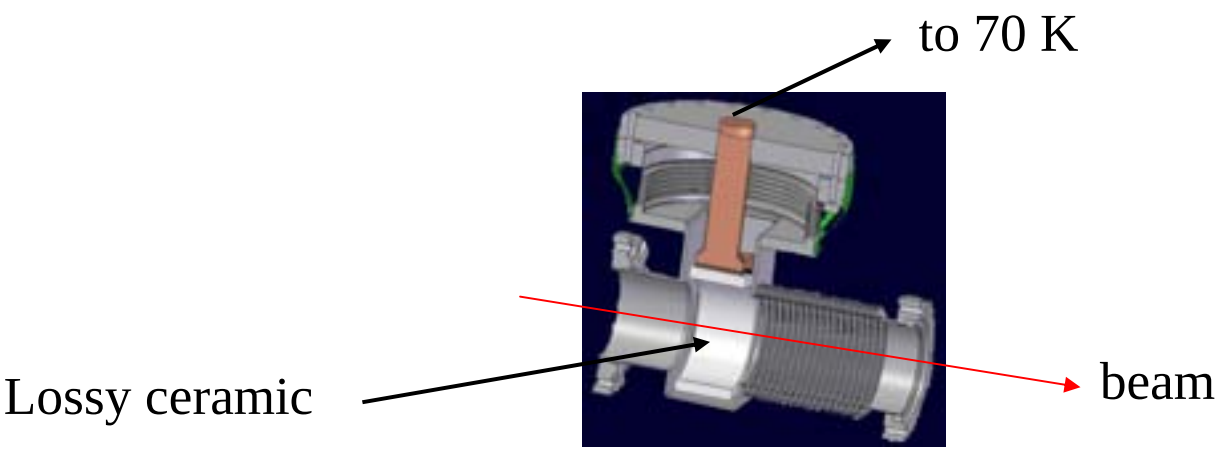
2xHOM couplers/cavity (HOMs below cut-off).




**Transfer function**




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

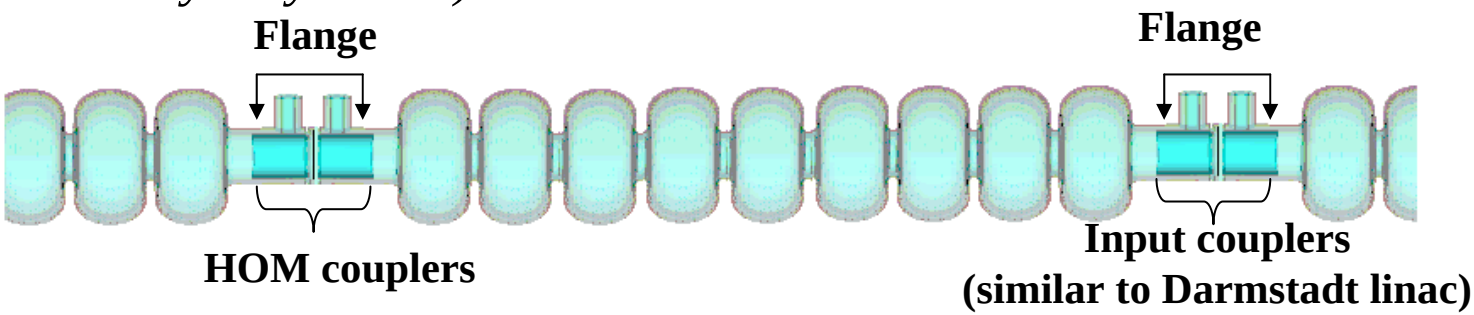
1. R&D program towards reducing costs of HOM couplers

- 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