Abstract

For the XFEL project industrial companies in Germany and Italy are in charge of the cavity fabrication and preparation. For the radio frequency acceptance test these cavities have to be transported to the DESY site in Hamburg without losing the performance. The XFEL Beam Position Monitor and Quadrupol Units (BQU) are completed in the DESY clean room. The cavities and the BQU are handed out in the status “ready for assembly” to the string assembly site at CEA Saclay in France. These components have to be transported without risk of damages or reduction of performance. To ensure that the transports over European routes do not influence the performance of cavities or are origin of particulates inside the BQU, individual transport boxes for super conduction cavities and transport fixtures for the BQU are designed and tested.

Matter of transport simulations

The RF Test result before, in-between and after two transport simulations shows no degradation of the maximum gradient and no significant changes in the field emission onset.

The CW Test result of cavity Z138

<table>
<thead>
<tr>
<th>Test object</th>
<th>Test type</th>
<th>Parameter</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cavity in frame fixed on simulator (C24)</td>
<td>Resonant search (Pic. 1)</td>
<td>20 Hz to 4 Hz</td>
<td>Sleep and high peaks at 60 Hz, 90 Hz and 110 Hz</td>
</tr>
<tr>
<td>Cavity in transport box (Z138)</td>
<td>Resonant search (Pic. 3)</td>
<td>30 Hz to 4 Hz</td>
<td>No mechanical deformation of the cavity</td>
</tr>
</tbody>
</table>

Transportation routes across Europe for XFEL Cavities

Transport boxes

Damping lay-out

Transport equipment for the BQU

Summary

Transport study shows no influence on mechanical stability and RF performance

During real transportation to CEA Saclay, an online running shock log device shows no signal above 0.5g.

The boxes withstand all forces

Transportation of HiGrade Cavities

HiGrade cavities will be delivered without helium tank but in a handlings frame

The prism of the standard box can be removed and a support for the cavity in frame can be inserted

BQU on platform with
- handlings cart
- inside clean room

... with dust cover
- sealed with rubber gasket
... in transport frame
- out side clean room

... with additional lid

Stead wire damper,
calculated to absorb a
free fall out of 50mm

More information about fixtures and handling of the BQU see poster TUP0018

Transport studies are not finished yet and will be presented in near future

Real transport to CEA Saclay happens without damages

Deutsches Elektronen-Synchrotron
Helmholtz Association of German Research Centers
22603 Hamburg, Germany