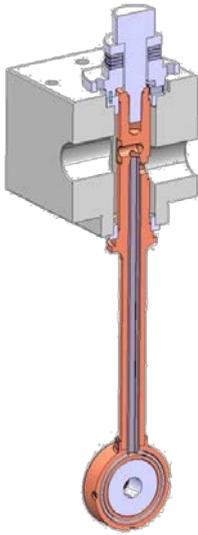


CERN Technology portfolio

Mounting mechanism for cantilever with high precision positioning



The invention generally relates to a mounting mechanism for mounting an elongate element to a holding structure. The new invention solves the problem of precisely mounting a cantilever to a structure in a vacuum tight, radiation hard way, where no further alignments are needed. One particular application, and the reason for the developments at CERN is to use such mounting mechanisms to mount and precisely position drift tubes in a linear accelerator.

Area of expertise

Mechanical engineering; Accelerators and beam physics.

Applications

This invention can be applied to any cantilever or group of cantilevers that needs to be held in a predefined position given by reference surfaces, in particular when fixed inside a vacuum or pressure vessel and aligned with high precision. Initially the primary application is for Drift Tubes (DT) in Drift Tube LINACs (DTLs).

Innovative features

- Precision obtained through innovative design and precise machining.
- Seal in metal: In Radio Frequency (RF) cavities metal seals provide for the continuity of the vacuum and the RF envelope at the same time. Using metal seals improves the long-term reliability of the assembly. It replaces previous solutions based on bellows or rubber seals
- The mounting mechanism provides the required longitudinal forces compressing the metal seal to make it leak tight and it avoids transversal forces that could lead to unwanted deformations.

Advantages

- The mounting mechanism allows installing an elongate element to a structure quickly and reliable without adjustment after assembly
- De- and re-installation is straightforward and precise
- The use of metal seals instead of rubber seals makes their application radiation hard and thus reliable
- No adjustment after assembly is needed. Accidental movements related to this operation are made impossible

Limitations

High machining precision is required.

Intellectual Property status

The technology has been prototyped and tested within the framework of the LINAC4 project at CERN. Ready for licensing. Patented technology (PCT). CERN may provide knowledge transfer support and consultancy.

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