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Impedance analysis of deformable RF contact bridges for high luminosity LHC

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In order to maintain the continuity of the vacuum system wall and comply with beam stability limits, radio frequency contact bridges are utilised as transitional elements in beam vacuum line interconnections. These radio frequency contact bridges must absorb and correct longitudinal, angular, and transverse misalignments brought on by mechanical motions during assembly, alignment, operating phases and thermal influences during accelerator operation. A deformable thin-walled copper beryllium structure is the foundation of a novel deformable radio frequency contact bridge concept that satisfies the above criteria without using conventional sliding contacts. To assess the feasibility of implementing such deformable radio frequency contact bridges in the High-Luminosity LHC, the longitudinal, dipolar, and quadrupolar components of the beam impedance in the two transverse planes were determined using electromagnetic simulations.

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Footnotes

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Yes

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