Gusset Design and Analysis of the RIA Two Spoke Cavity *

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The Two Spoke Cavity for the Rare Isotope Accelerator (RIA) operates at 4 K in boiling helium. This operating mode produces pressure variations that affect the resonant RF frequency of the cavity. The design of the gusset includes shaping that attempts to cancel the effects in the magnetic field region with those in the electric field region. A mechanical tuner is also proposed that primarily produces frequency shift from the electric field. The goal of the design is to produce a significantly larger frequency shift with the mechanical tuner than results from pressure variations. The design requirements include room temperature stress limits and a 21 psi pressure differential.

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