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Magnetic Force and Related Parameter Evaluation of High Current Striplines for Neutrino Beamlines

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Both the NuMI beamline, that has been providing intense neutrino beams for several experiments (MINOS, MINERvA, NOvA), and the newly proposed LBNF beamline which plans to produce the highest power neutrino beam in the world for the DUNE experiment, need pulsed magnetic horns to focus the mesons which decay to produce neutrinos. The high current horn and stripline design has been evolving as NuMI reconfigures for higher beam power and as LBNF produces designs for even higher beam power and horn current. In this talk, we present calculations of the EM interaction of the stripline plates of the NuMI horns at critical stress points, using POISSON and ANSYS MAXWELL 3D codes for 200kA of current to the horns. In addition, we give the thermal and electrical simulation results using ANSYS Electrical code. These results are being used to support the development of evolving horn stripline designs to handle increased electrical current and higher beam power for NuMI upgrades and for LBNF.

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