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MgB2 Beam Transport Channel for a Strong Focusing Cyclotron

KARIE MELCONIAN, KYLE DAMBORSKY, JOSHUA KELLAMS, PETER MCINTYRE, NATHANIEL POGUE, AKHDIYOR SATTAROV, SAEED ASSADI, Texas A&M University — A superconducting strong focusing cyclotron is being developed for high current applications. Alternating-gradient focusing is provided by an array of $\sim 6\text{T/m}$ superconducting beam transport channels which lie along the beam trajectories in the sectors of the cyclotron. The $\sim 1\text{T}$ sector dipoles, corrector dipoles, and Panofsky type quadrupoles utilize MgB2 superconductor operating in the range 15-20 K. The quadrupole windings make it possible to produce strong focusing of the transverse phase space throughout acceleration. The trim dipole makes it possible to maintain isochronicity and to open the orbit spacing at injection and extraction. The design, development and prototype progress will be presented.

Karie Melconian
Texas A&M University

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