1172-46-6 **Justin R Hill*** (jhill184@alamo.edu). *A Novel Non-Linear Matrix System Optimization Technique with Application to Transcranial Magnetic Stimulation Coil Optimization through an Inverse Boundary Element Method PDE Formulation.*

The researcher details a novel method for solving Max-Min Matrix systems that applies, in particular, to non-linear, convex systems. This method relies specifically on properties of Banach Spaces and Eigenvectors. The researcher then details it's application to optimizing Transcranial Magnetic Stimulation Coils for different performance parameters; parameters that are modeled by Inverse BEM PDE formulations. Finally, the researcher will talk on their current and future progress to utilize this optimization method to solve non-linear, convex, partial differential equations in general. (Received July 02, 2021)