

1171-15-4

**Justin R. Hill\*** (jhill1184@alamo.edu), 1226 Paso Hondo, San Antonio, TX 78202, and  
**Francisco Javier Garcia-Pacheco, Clemente Cobos Sanchez and Jose Maria  
Guerrero-Rodriguez.** *Solutions for Non-Linear Convex Matrix Systems, with Applications to  
Non-Linear Convex Partial Differential Equations and Transcranial Magnetic Stimulation Coil  
Design Optimization.*

The presenter will first detail a novel solution method for Max-Min Non-Linear Convex Matrix Systems using properties of Banach spaces, a Cholesky decomposition, and Eigenvectors. It's previous application to optimizing Transcranial Magnetic Stimulation Coil design for given performance parameters will be touched on; and then it's general application to Matrix Systems will be expounded upon. Finally, the presenter will preview their current work in using this method to solve Convex, Non-Linear PDE's; and hopefully future applications to vortex characterization and the Navier-Stokes Problem. (Received May 07, 2021)