1125-14-535 **Nate Strawn*** (nate.strawn@georgetown.edu), Department of Mathematics and Statistics, Georgetown University, Washington, DC 20007, **Jameson Cahill** (jamesonc@nmsu.edu), Department of Mathematical Sciences, New Mexico State University, Las Cruces, NM 88003, and **Dustin Mixon** (dustin.mixon@afit.edu), Department of Mathematics and Statistics, Air Force Institute of Technology, Wright-Patterson AFB, Dayton, OH 45433. *Connectivity and Irreducibility of Finite Unit-Norm Tight Frame Varieties.*

Finite Unit-Norm Tight Frames (FUNTFs) are redundant linear dictionaries with applications in compression and the robust transmission of signals. As algebraic varieties, FUNTF varieties are intersections of Stiefel manifolds and products of spheres, and Eigensteps (or Gelfand-Tsetlin patterns) provide useful local parameterizations. Exploiting these parameterizations, we demonstrate that FUNTF varieties are connected, verifying a conjecture by Dykema et al. from 2006. After introducing this initial connectivity result, we refine our technique to further demonstrate the connectivity of the sets of nonsingular points of the FUNTF varieties, which is in turn used to show that FUNTF varieties are irreducible. One corollary of this last result is that a generic FUNTF has full spark, which provides theoretical support for compressed sensing applications of random FUNTFs. (Received September 05, 2016)