1116-VI-1310 **Somantika Datta** and **Jesse Ernest Oldroyd*** (`jesseo@uidaho.edu`), Moscow, ID 83844.

Constructing approximations to equiangular tight frames. Preliminary report.

Consider a collection of N unit vectors $\{f_i\}_{i=1}^N$ in $\mathbb{C}^d$ or $\mathbb{R}^d$. This set is called an equiangular tight frame (ETF) if the cross-correlation between any distinct vectors has modulus given by the Welch bound. ETFs have properties that make them useful in signal processing, and their construction has become an important problem in applied harmonic analysis. Unfortunately ETFs do not exist for all choices of N and d, and it is well known that no ETF of N vectors exists for $N > \frac{d(d+1)}{2}$ in the real case and for $N > d^2$ in the complex case. The focus of this talk is to construct unit-normed frames that approximate ETFs in some sense. If $N \leq \frac{d(d+1)}{2}$ in the real case or $N \leq d^2$ in the complex case, a construction is proposed that starts with a known equiangular frame and then adjusts the eigenvalues of the corresponding Gram matrix by means of random perturbations to improve tightness of the resulting frame. A second construction is proposed for arbitrary N that starts with a known ETF of $m < N$ vectors in $\mathbb{R}^d$ or $\mathbb{C}^d$ and then increases the size of the frame to N by building new frame vectors from the starting m vectors. (Received September 21, 2015)