1108-41-295   **Somantika Datta*** (`sdatta@uidaho.edu`) and **Jesse Oldroyd** (`jesseo@uidaho.edu`).
Approximating Equiangular Tight Frames.

An equiangular tight frame (ETF) is a set of unit vectors in a Hilbert space such that the modulus of the inner products between pairs of vectors are identical and as small as possible. ETFs have found applications in communications, coding theory, and sparse approximation. It has been shown that ETFs are optimal for signal representation in erasure channels. Therefore, it is highly desirable to construct ETFs. However, in most cases ETFs do not exist and can be very hard to construct when they do exist. This leads to the problem of constructing objects that are in some sense close to ETFs and will be referred to as approximate ETFs.

Two different approaches to obtaining approximate ETFs will be explored. First, instead of requiring the modulus of the inner products between pairs of vectors to be identical, the moduli of these inner products will take values from a set of k values, where k is small. Tight frames having this property will be called k-distance tight frames. Another approach is to construct frames such that (i) all eigenvalues of the frame operator lie in a small interval, and (ii) the modulus of the inner products of the frame vectors also lie in a small interval. These frames are nearly tight and nearly equiangular and offer another way to approximate ETFs. (Received January 16, 2015)