1154-46-1572 **Robert Calderbank**, **Ingrid Daubechies**, **Daniel Freeman*** (daniel.freeman@slu.edu) and **Nikki Freeman**. *Stable phase retrieval from magnitude of point evaluation for infinite dimensional subspaces of $L_2(R)$.*

Let H be a real Hilbert space and let $(\phi_j)_{j\in J} \subseteq H$. We say that $(\phi_j)_{j\in J}$ does phase retrieval if whenever $x, y \in H$ and $(|\langle x, \phi_j\rangle|)_{j\in J} = (|\langle y, \phi_j\rangle|)_{j\in J}$ we have that $x = y$ or $x = -y$. In the case that $(\phi_j)_{j\in J}$ is a frame, the analysis operator $\Theta(x) = (\langle x, \phi_j\rangle)_{j\in J}$ is an isomorphic embedding of H into $l_2(J)$. Thus phase retrieval using a frame is equivalent to recovering $f \in \Theta(H) \subseteq l_2(J)$ from $|f|$ (up to a unimodular scalar).

Phase retrieval is always stable for finite dimensional spaces. On the other hand, it is known that phase retrieval using frames is always unstable for infinite dimensional Hilbert spaces. This is equivalent to phase retrieval from point evaluation is always unstable for infinite dimensional subspaces of l_2. In contrast to this, we present a construction of infinite dimensional subspaces of $L_2(R)$ where phase retrieval from point evaluation is stable. By restricting to subspaces, we have new finite dimensional examples where phase retrieval is uniformly stable independent of the dimension. (Received September 16, 2019)