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Chun-Kit Lai*, Department of Mathematics, San Francisco State University, 1600 Holloway Ave, San Francisco, CA 94132, and **Luke Evans**. *Conjugate phase retrieval on \mathbb{C}^M by real vectors*. Preliminary report.

Complex phase retrieval on a Hilbert space \mathcal{H} is to recover unknown vectors up to a phase angle from the absolute value of its linear measurements with a frame. i.e.

$$|\langle x, \varphi_n \rangle| = |\langle y, \varphi_n \rangle| \quad \forall n \text{ implies } x = e^{i\theta} y.$$

However, it suffers from the problem that none of the φ_n can be a real vector. Otherwise, x and \bar{x} cannot be distinguished. We propose a new notion called *conjugate phase retrieval*

$$|\langle x, \varphi_n \rangle| = |\langle y, \varphi_n \rangle| \quad \forall n \text{ implies } x = e^{i\theta} y \text{ or } x = e^{i\theta} \bar{y}.$$

In particular, we show that conjugate phase retrieval on \mathbb{C}^M by real vectors is possible. Moreover, We also study the minimum numbers of real vectors required generic real frame performing conjugate phase retrieval. This is a joint work with Luke Evans. (Received July 16, 2017)