1151-47-310 **Mai Tran*** (mai.tran@westpoint.edu), United State Military Academy West Point, 606 Thayer Road, Thayer Hall Room 256B, West Point, NY 10996, and **Rongwei Yang**. *Non-Euclidean Metric on the Resolvent Set.* Preliminary report.

For a bounded linear operator A on a complex Hilbert space $\mathcal{H}$, the Douglas-Yang metric on the resolvent set $\rho(A)$ by the metric function $g_{\vec{x}}(z) = \left\| \left(A - z\mathbf{I}\right)^{-1} \vec{x} \right\|^2$, where $\vec{x} \in \mathcal{H}$ with $\|\vec{x}\| = 1$.

The Douglas-Yang metric provide the opportunity to see what particular properties relating to the operator A can be determine by the use of geometry. We look at how the arc length, curvature, and geodesic equations are defined with respect to the Douglas-Yang metric in the case when A is nilpotent operator and the unilateral shift operator. When A is the unilateral shift operator on the Hardy space $\mathbf{H}^2(\mathbb{D})$, the metric function $g_f(z)$ with respect to the Douglas-Yang metric is dependent on the chosen function $f \in \mathcal{H}(\mathbb{D})$. We determine the extremal values of the arc length on of circle C_r centered at the origin with radius r with respect to the Douglas-Yang metric. We showed that the maximal value is reached precisely when f is an inner function.

Other considerations include defining the metric function $f_A(z)$ by using trace, extremal values of the Ricci curvature with respect to the Douglas-Yang metric. (Received August 21, 2019)