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**Andrew J. Klimas\*** ([aklimas@xula.edu](mailto:aklimas@xula.edu)), Xavier University of Louisiana, Department of Mathematics, One Drexel Drive, New Orleans, LA 70125. *The Construction of Faces of  $CP_2$* . Preliminary report.

This paper on the faces of the cone  $\pi(PSD_n)$  of positive semidefinite-preserving linear transformations on the complex vector space of complex matrices of order  $n$  and its self-dual subcone  $CP_n$  of the completely positive linear transformations explores in particular the construction of faces of  $CP_2$ . Carefully-chosen matrices can be used to construct faces of  $CP_2$  of dimensions 1, 4, 9, and 16. Using a characterization due to Kye, it can be determined whether any such face lies in the boundary or interior of  $\pi(PSD_2)$ . If a face of  $CP_2$  contains an element that lies in the interior of  $\pi(PSD_2)$ , it follows that the face cannot be a face of  $\pi(PSD_2)$ . Some faces of  $CP_2$  can be shown to lie in the boundary of  $\pi(PSD_2)$  while others can be shown to indeed lie in the interior of  $\pi(PSD_2)$ . A number of cases are open questions. (Received September 08, 2014)