Andrew J. Klimas* (aklimas@xula.edu), Xavier University of Louisiana, Department of Mathematics, One Drexel Drive, New Orleans, LA 70125. *The Construction of Faces of CP

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)