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Mary Beth Ruskai, Stanislaw Szarek and Elisabeth M Werner* (emw2@po.cwru.edu),
Department of Mathematics, Cleveland, OH 44106. *An Analysis of Completely-Positive
Trace-Preserving Maps on \mathcal{M}_2 .*

We give a useful new characterization of the convex set of all completely positive, trace-preserving maps $\Phi : \mathcal{M}_2 \rightarrow \mathcal{M}_2$ from which one can easily check any trace-preserving map for complete positivity. We also determine explicitly all extreme points of this set, and give a useful parameterization after reduction to a certain canonical form. This allows a detailed examination of an important class of non-unital extreme points which can be characterized as having exactly two images on the Bloch sphere. (Received January 20, 2001)