

# Applications of majorization to frame potentials

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We show the existence of minimums of certain sets  $F \subseteq \mathbb{R}^n$  with respect to the preorder of (vector) majorization (which are unique up to permutation of their coordinates). Then, we relate the existence of these minimums to some properties of the frame potential of Benedetto and Fickus, defined for frames of  $\mathbb{C}^n$  or  $\mathbb{R}^n$ . Moreover, this approach allow us to extend the properties of the frame potential of Benedetto and Fickus to more general convex potentials. For example, we show that the minimums of general convex potentials (under certain restrictions) are the tight frames, and we obtain general bounds for these convex potentials.