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Shujie Kang* (kangsj@math.umd.edu), 4176 Campus Drive - William E. Kirwan Hall, College Park, MD 20742. *Universal Minimizers of the p -Frame Potentials.*

The p -frame potential of a frame $\{v_i\}_{i=1}^N \subset \mathbb{R}^d$ is defined as $FP_{p,N,d} = (\sum_{i<j} |\langle v_i, v_j \rangle|^p)^{1/p}$. Here we investigate the minimizers of $FP_{p,N,d}$. In the special case $p = 2$, the minimizers were characterized as tight frames; and the $p = \infty$ case is related to the line packing problem. We focus on the special case $d = 2$. We prove that the minimizers of the p -frame potential in \mathbb{R}^2 are universal for large enough p including infinity, and that they can be obtained from spherical t-designs. In fact, we extend techniques developed by Cohn and Kumar involving absolutely continuous functions and ultraspherical polynomials. In addition, we present numerical results for the minimal $FP_{p,5,2}$ when $p < 2$. (Received September 15, 2019)