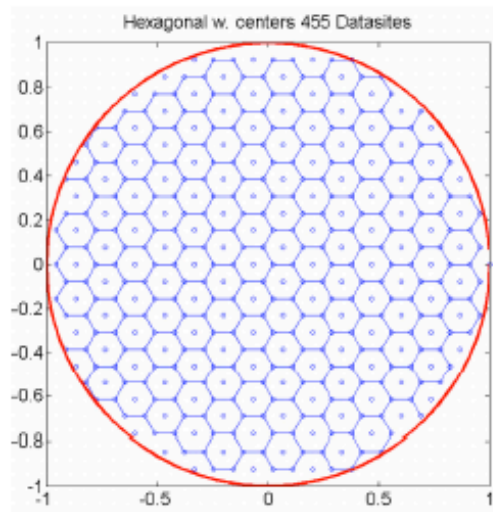
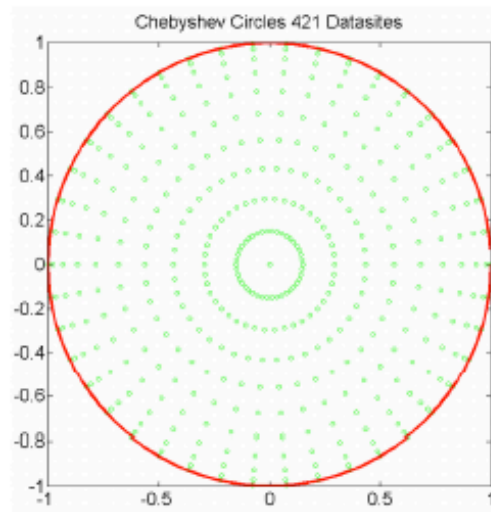


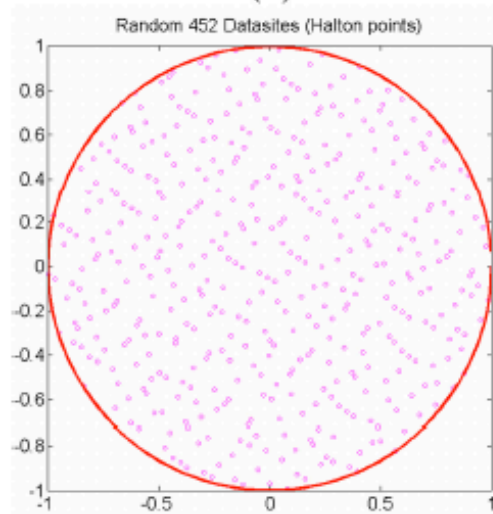
Kaya et al., Optics Express 19(27) 2011



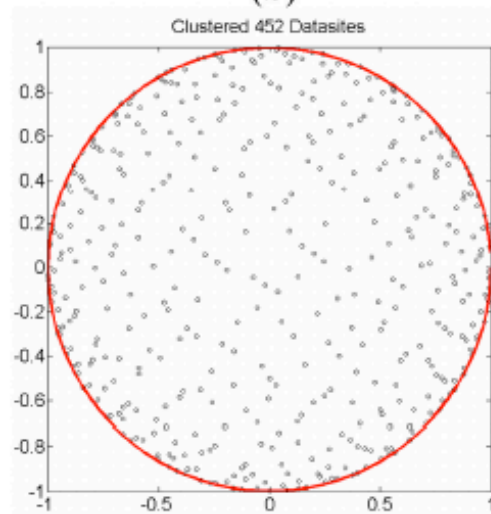
(a)



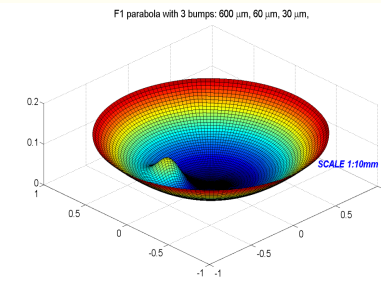
(b)



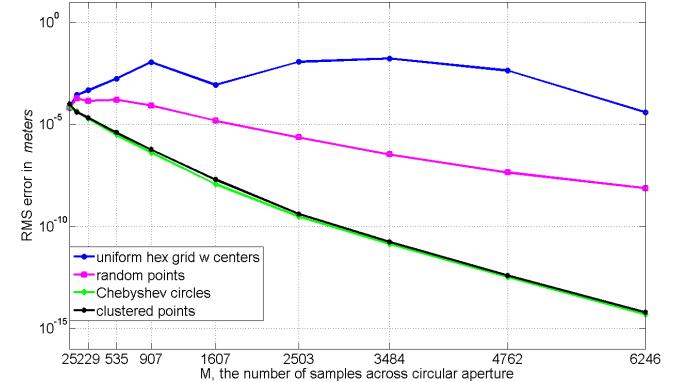
(c)



(d)



Zernike basis performance under different sampling for F1 Parabola with multiple Bumps Test Surface



RBF vs Zernike approximation performance for F1 Parabola with Bumps

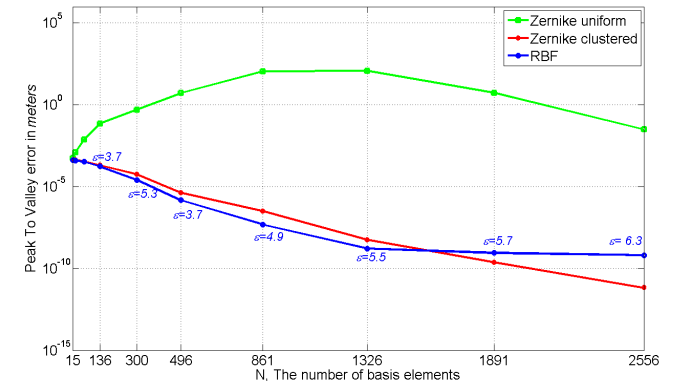


Fig. 5. Fitting grids used to demonstrate efficacy for data sampling: (a) hex grid, (b) Chebyshev polar grid (c) uni-random grid (Halton points) (d) e_clust-random grid that clusters points towards the boundary over the unit circle.

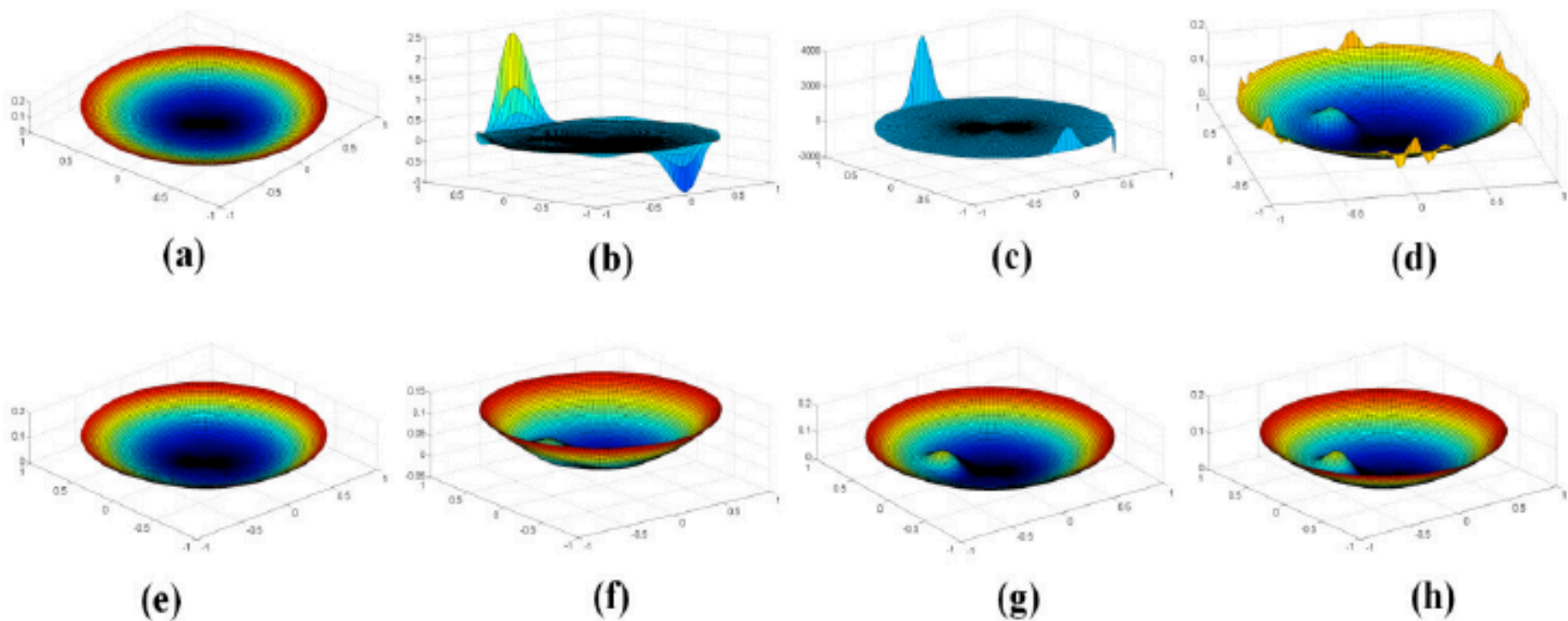
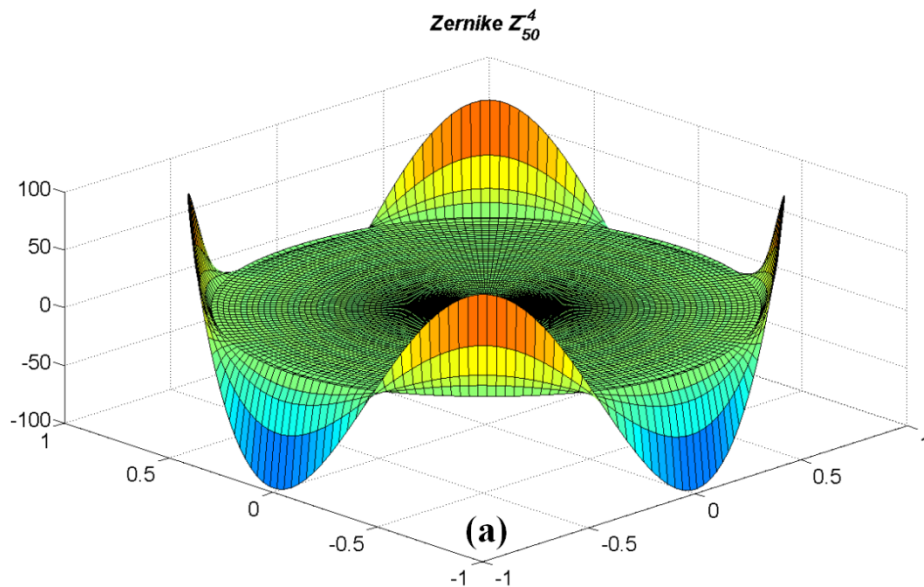
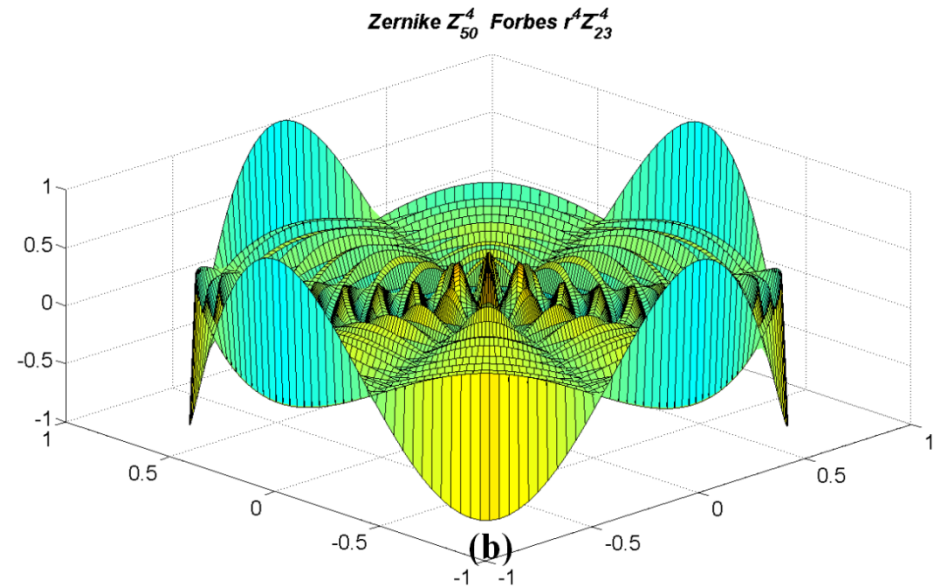


Fig. 8. Comparison of the approximants obtained with two different fitting grids for the F/1 parabola with bumps; Top row: Approximant with uni-hex grid sampling with (a) 25 samples, (b) 204 samples, (c) 1990 samples, (d) 4980 samples; Bottom row: Approximant with e_clust-random sampling with (e) 25 samples, (f) 204 samples, (g) 1990 samples, and (h) 4980 samples.

Some Subtleties & Some lessons learned!



Zernike's computed
without recursion

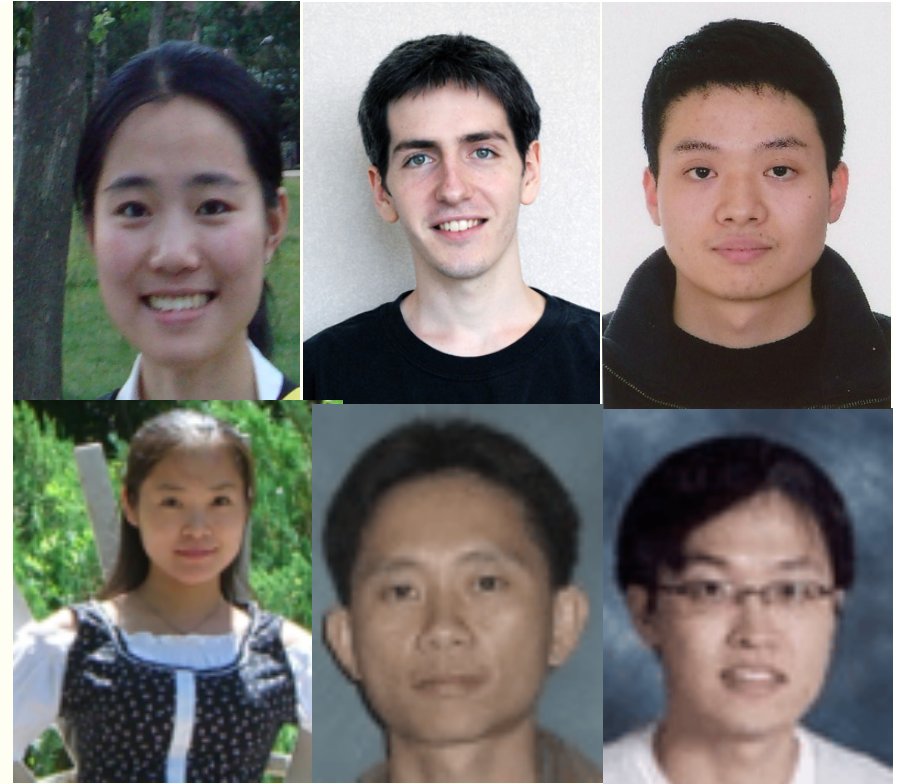
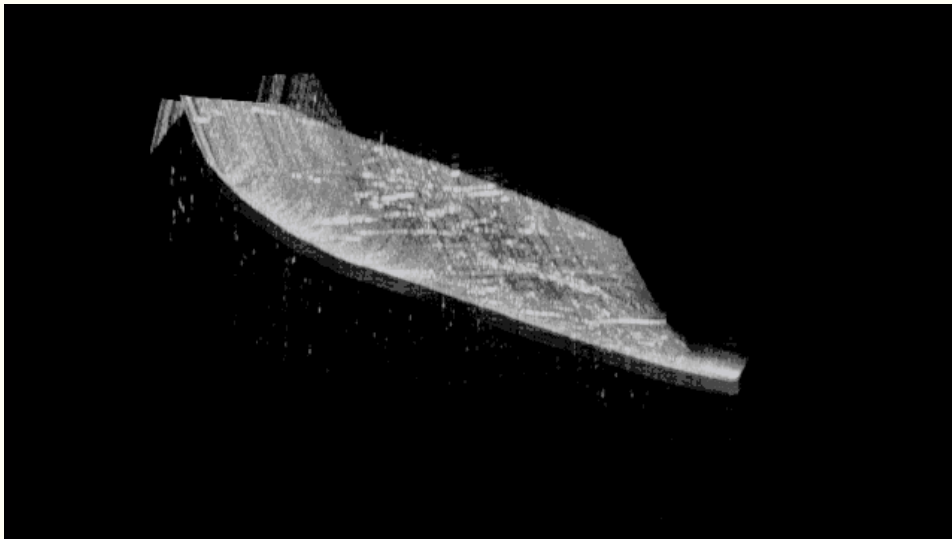


Zernike's computed
with recursion

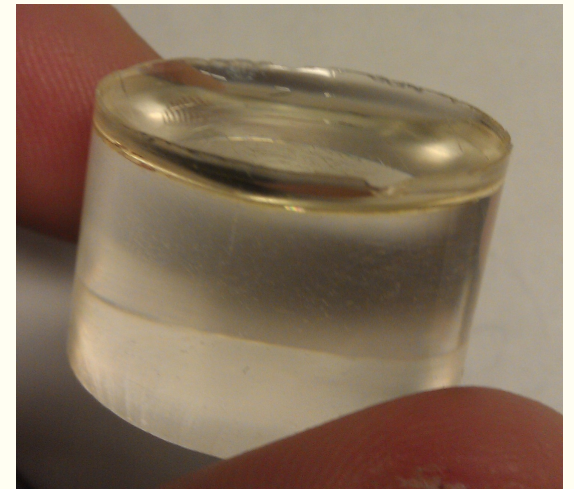
R.J. Noll, "Zernike polynomials and atmospheric turbulence" JOSA 66 (1976)

G.W. Forbes, "Robust and fast computation for the polynomials of optics" Opt. Express **18** (2010).

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Rolland et al., Optics Express 11(4) (2009)
Lee et al, Opt. Letters 36(12) 2011



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