

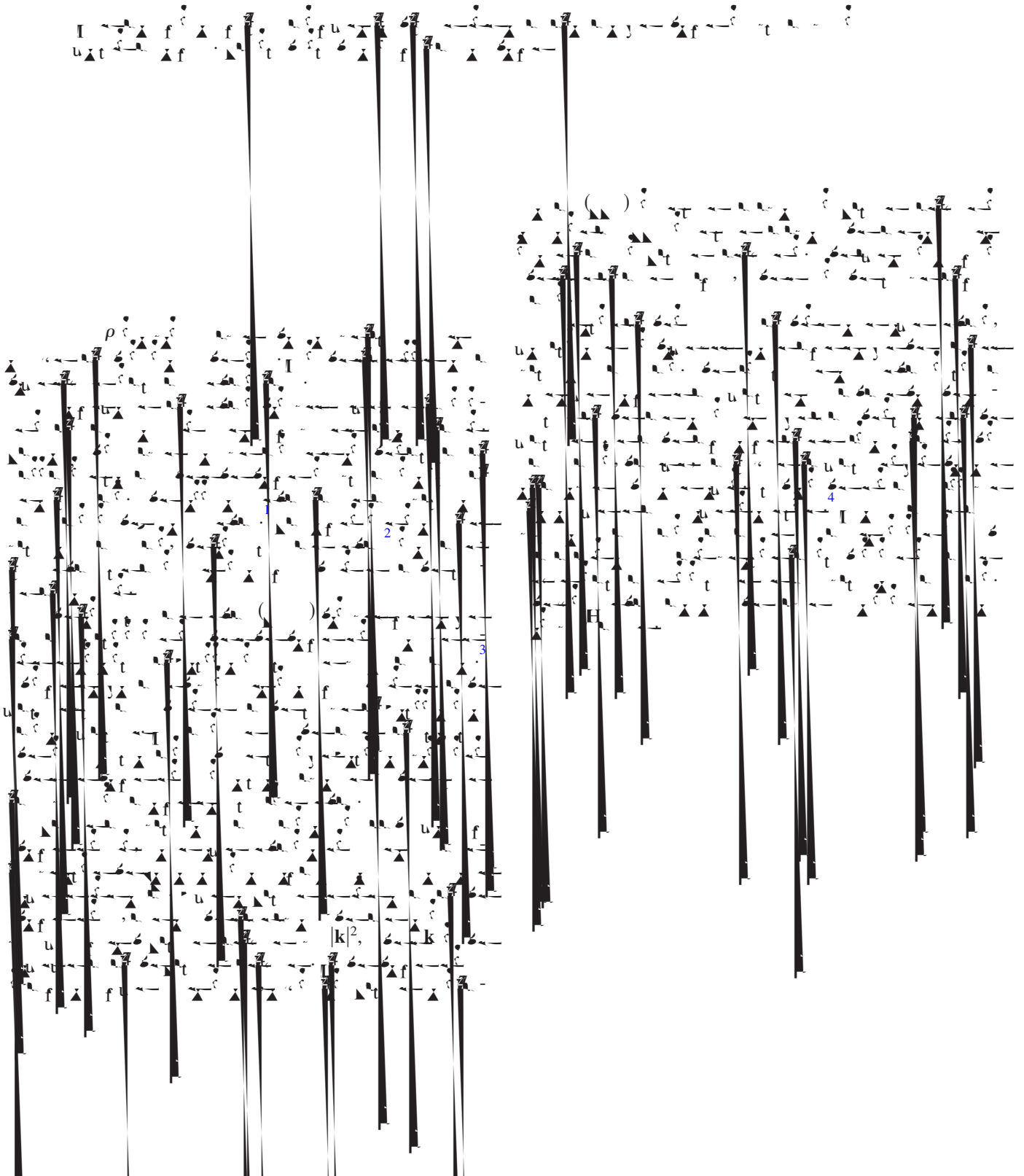
Efficient solution of Poisson's equation with free boundary conditions

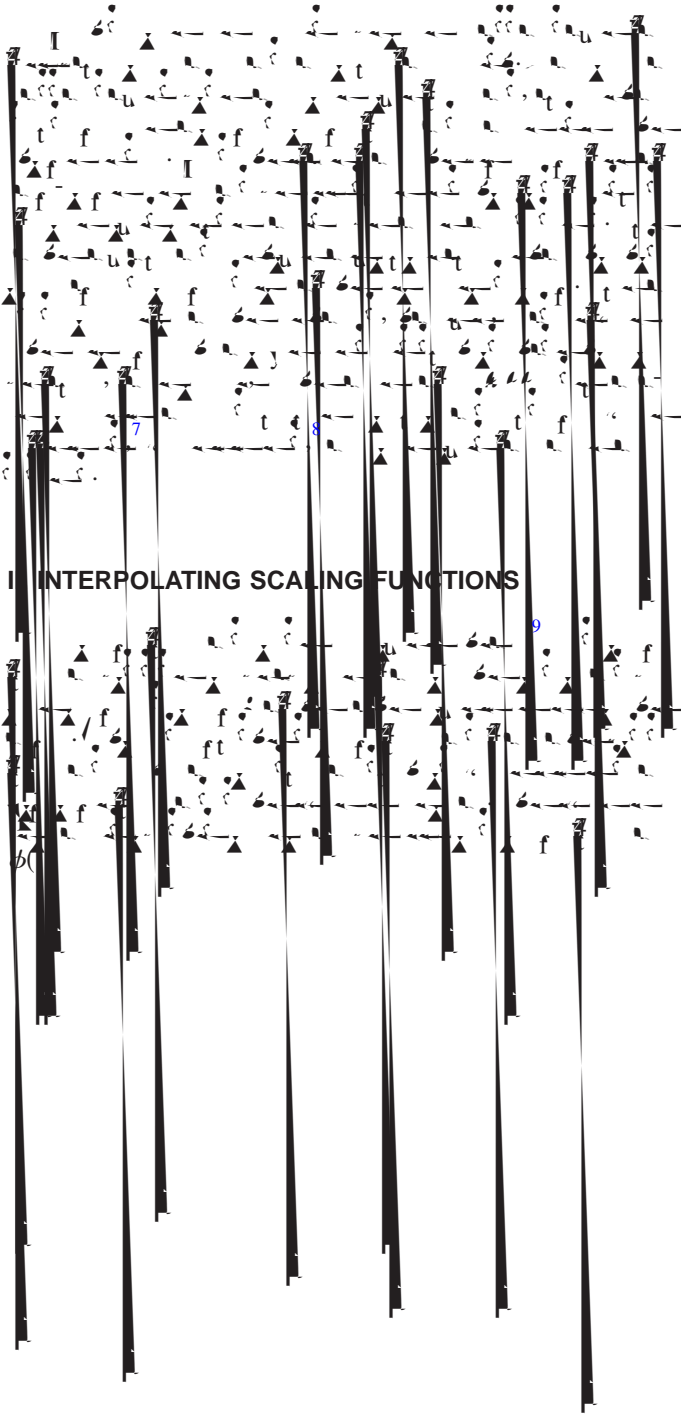
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Gregory Beylkin

([arXiv:1506.02133](#), 2016; [arXiv:1306.02133](#), 2013; [arXiv:1706.02133](#), 2017; [arXiv:1706.02133](#), 2017)





INTERPOLATING SCALING FUNCTIONS

$$= \mathbf{r}_{j, 2, 3}, \quad \mathbf{r}_{1, 2, 3} = (r_1, r_2, r_3)$$

Handwritten musical notation on a page with four staves. The notation includes various notes, rests, and dynamic markings such as 'f' and 'u'. The staves are connected by vertical lines, and there are several long vertical lines extending downwards from the bottom of the staves.

Handwritten musical notation on a page with six staves. The notation includes various notes, rests, and dynamic markings such as 'f' and 'u'. The staves are connected by vertical lines, and there are several long vertical lines extending downwards from the bottom of the staves. The page contains several annotations in blue ink: a '3' above the second staff, a '1/8' above the third staff, a '17 (' above the fourth staff, an 'H' above the fifth staff, and a '16' above the sixth staff.

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APPENDIX: PROOF OF EQ. (6)

(6)

$$\rho(r) = \sum_{r_1, r_2, r_3} \rho_{r_1, r_2, r_3} \phi(r_1) \phi(r_2) \phi(r_3) \quad (1)$$

$$\sum_{r_1, r_2, r_3} r_1^2 r_2^2 r_3^2 \rho_{r_1, r_2, r_3} = \int r_1^2 r_2^2 r_3^2 \rho(r) \quad (2)$$

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$$\int \phi(r) = \delta_{r,0}, \quad r=0, \dots, 1. \quad (3)$$

$$\int \phi(r) = \int \phi(r) \sum_{r_1, r_2, r_3} \rho_{r_1, r_2, r_3} = \int \phi(r) \rho(r) \quad (4)$$