

# SUPER-RESOLUTION RECONSTRUCTION FROM TRUNCATED FOURIER TRANSFORM

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We present recent theoretical and numerical results on recovering a compactly supported function  $v$  on  $\mathbb{R}^d$ ,  $d \geq 1$ , from its Fourier transform  $Fv$  given within the ball  $B_r$ . We proceed from known results on the prolate spheroidal wave functions and on the Radon transform. The most interesting point of our numerical examples consists in super-resolution, that is, in recovering details beyond the diffraction limit, that is, details of size less than  $\pi/r$ , where  $r$  is the radius of the ball mentioned above. This talk is based, in particular, on the works [1] and [2].

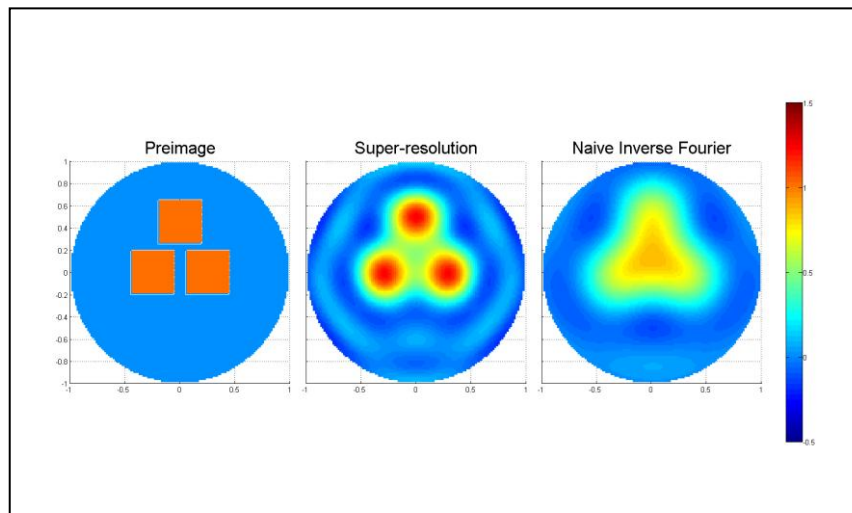


Fig. 1: Example of our super-resolution reconstruction in comparison with preimage  $v$  and naive Fourier inversion, for  $d = 2$

[1]. M. Isaev, R.G. Novikov, J. Math. Pures et Appl. 163, 318-333 (2022)

[2]. M. Isaev, R.G. Novikov, G.V. Sabinin, Inverse Problems 38, 105002 (2022)