Alternating Krylov subspace image restoration methods

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Alternating methods for image deblurring and denoising have recently received considerable attention. The simplest of these methods are two-way methods that restore contaminated images by alternating between deblurring and denoising. This talk discusses Krylov subspace-based two-way alternating iterative methods that allow the application of regularization operators different from the identity in both the deblurring and the denoising steps. Numerical examples show that this can improve the quality of the computed restorations. The methods are particularly attractive when matrix-vector products with a discrete blurring operator and its transpose can be evaluated rapidly, but the structure of these operators does not allow inexpensive diagonalization.