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Alternating direction method with Gaussian back substitution for separable convex programming. (English) [Zbl 1273.90152](#)
SIAM J. Optim. 22, No. 2, 313-340 (2012).

The Douglas-Rachford alternating direction method of multipliers has been well studied for solving linearly constrained separable convex minimization problems whose objective function is separated into two individual convex functions with nonoverlapping variables. The case of more than two convex functions is still open. By combining a Douglas-Rachford alternating direction method of multipliers with a Gaussian back substitution procedure, this paper develops an efficient method for solving the linearly constrained separable convex minimization problem whose objective function is separated into m ($m \geq 3$) individual functions with nonoverlapping variables. The convergence of the new method is proven via the analytic framework of contractive-type methods and its efficiency is shown for solving some concrete applications arising in various disciplines.

Reviewer: [Jean-Jacques Strodiot \(Namur\)](#)

MSC:

[90C25](#) Convex programming

[65K05](#) Numerical mathematical programming methods

[94A08](#) Image processing (compression, reconstruction, etc.) in information and communication theory

Cited in **1** Review
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Keywords:

[alternating direction method](#); [convex programming](#); [Gaussian back substitution](#); [separable structure](#)

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