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**SPLITTINGS FOR ITERATIVE SOLUTION OF  
LINEAR SYSTEMS**

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Consider iteratively solving a linear system

$$Ax = b, \tag{1}$$

with invertible  $A \in \mathbb{C}^{n \times n}$  and  $b \in \mathbb{C}^n$ , by splitting the matrix  $A$  as

$$A = L + R, \tag{2}$$

where  $L$  and  $R$  are both readily invertible. In such a case the recently introduced residual minimizing Krylov subspace method [1] can be executed, allowing, in a certain sense, preconditioning simultaneously with  $L$  and  $R$ .

Splitting satisfying (2) result either from the structure of the problem, or are algebraic. Splittings of Gauss-Seidel type belong to the latter category. In this talk we discuss such splittings of  $A$ .

This is joint work with Mikko Byckling.

# Bibliography

- [1] M. HUHTANEN AND O. NEVANLINNA, *A minimum residual algorithm for solving linear systems*, submitted manuscript available at [www.math.hut.fi/~mhuhtane/index.html](http://www.math.hut.fi/~mhuhtane/index.html).