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**Operator Splitting Methods in 4D Variational Data
Assimilation.**

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In this paper, we give a framework 4D variational data assimilation (4D-Var) in Hilbert Spaces. In functional partial differential equation setting, the adjoint equation method and Marchuk-Strang operator splitting are discussed. Convergence analysis of the operator splitting method is investigated for the functional 4D-Var.