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Operator splitting and optimal control of gas storage

We consider a natural gas storage facility where the gas is to be traded on a mixture of spot and forward markets. The problem of determining the optimal operating and marketing strategy for such a facility, and its associated value, is complicated by the range of potential markets for the gas, and by the physical characteristics of the facility which create state-dependent constraints on the allowable injection/withdrawal rates. In [SIAM JFM 4(1) 427-451, 2013] we proposed an operator-splitting approach for time-discretisation of the associated HJB equation in a simple one-factor spot price model, and proved convergence to the viscosity solution. Here we expand that approach to a multi-factor polynomial process setting, where the application of one of the operators corresponds to a set of intrinsic value computations exploiting the structure of the forward curve with injection/withdrawal rates conforming to system constraints.