Online performance monitoring of recombinant protein production in a fed-batch reactor

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This works presents the development of a minimal parameter first-principle process model for the production of streptokinase using a recombinant *E.Coli* in a fed-batch reactor. The minimal parameter models are obtained by model-reduction from the complex primary model. The model-reduction was done based on a parameter sensitivity analysis. The observer for predicting the immeasurable internal states online like specific growth rate, specific uptake of alkaline species (Ammonium) , and specific production of acidic species (acetic acid) are developed, using the online measurements of exit gas (CO_2 & O_2),Dissolved Oxygen (PO_2) and Alkali dosed and the substrate feed rate. The state estimation using an Extended Kalman Filter (EKF) and filter based on spline interpolation using Stirlings formula are presented.