

### A novel approach for adaptive data-driven modeling

이영학, 진형대<sup>1</sup>, 한중훈<sup>2,\*</sup>  
서울대학교 자동화시스템공동연구소;  
<sup>1</sup>포항공과대학교 화학공학과;  
<sup>2</sup>서울대학교 응용화학부  
(chhan@snu.ac.kr\*)

Process monitoring based on PLS models has played an important role in detecting process upsets, off-spec qualities, or other special events. However, the frequent changes of operating conditions require frequent updates of models. The key of adaptive modeling is the fast and correct identification of operating mode changes from normal variations due to disturbances. This paper proposes a novel adaptive PLS modeling approach based on a method for detecting and classifying process state changes into operating mode changes or variations due to disturbances. Key idea is to extract process knowledge on detecting operating mode changes as if-then rules. If the changing state is not accepted through the defined rules, the change is classified as the variation due to disturbances. Then, PLS model is updated with two alternative update styles when identifying the changed states as mode change: update of only scaling parameter or all the model parameter. The proposed approach was applied to process data collected from an industrial fired heater. It showed less update frequency and better prediction performance than block-wise recursive PLS approach.