



Contribution ID: 41

Type: **not specified**

## Dubious new control chart designs —a disturbing trend

*Tuesday, 14 September 2021 12:00 (20 minutes)*

For the last twenty years, a plethora of new “memory-type” control charts have been proposed. They share some common features: (i) deceptively good zero-state average run-length (ARL) performance, but poor steady-state performance, (ii) design, deployment and analysis significantly more complicated than for established charts, (iii) comparisons made to unnecessarily weak competitors, and (iv) resulting weighting of the observed data overemphasizing the distant past. For the most prominent representative, the synthetic chart, these problems have been already discussed (Davis/Woodall 2002; Knoth 2016), but these and other approaches continue to gain more and more popularity despite their substantial weaknesses. Recently, Knoth et al. (2021a,b) elaborated on issues related to the PM, HWMA, and GWMA charts. Here, we want to give an overview on this control chart jumble. We augment the typical zero-state ARL analysis by calculating the more meaningful conditional expected delay (CED) values and their limit, the conditional steady-state ARL. Moreover, we select the competitor (EWMA) in a more reasonable way. It is demonstrated that in all cases the classical chart should be preferred. The various abbreviations (DEWMA ... TEWMA) will be explained during the talk.

DAVIS, WOODALL (2002).

”Evaluating and Improving the Synthetic Control Chart”.  
JQT 34(2), 200–208.

KNOTH (2016).

”The Case Against the Use of Synthetic Control Charts”.  
JQT, 48(2), 178–195.

KNOTH, TERCERO-GÓMEZ, KHAKIFIROOZ, WOODALL (2021a).

”The Impracticality of Homogeneously Weighted Moving Average and Progressive Mean Control Chart Approaches”.  
To appear in QREI.

KNOTH, WOODALL, TERCERO-GÓMEZ (2021b).

”The Case against Generally Weighted Moving Average (GWMA) Control Charts”. Submitted.

### Keywords

superfluous control charts, conditional expected delay, change point

### Special/invited session

**Primary authors:** KNOTH, Sven (Helmut Schmidt University Hamburg, Germany); Prof. TERCERO-GOMEZ, Victor (Tecnologico de Monterrey, Monterrey, Nuevo Leon, Mexico); Prof. KHAKIFIROOZ, Marzieh (Tecnologico de Monterrey, Monterrey, Nuevo Leon, Mexico); Prof. WOODALL, William (Virginia Tech, Blacksburg VA, USA)

**Presenter:** KNOTH, Sven (Helmut Schmidt University Hamburg, Germany)

**Session Classification:** Process 1

**Track Classification:** Process