

# Tunable Pulse-Shaping Wave Digital Filter Network

*S.A. Samad*

## **Abstract**

This paper describes the design of Wave Digital Filters (WDFs) that perform basic functions of classical analogue pulse-shaping networks in radiation spectroscopy. The resulting WDF structures realize CR-RC type and semi-Gaussian shaping of digitised, preamplifier signals. The basic section of the WDF is derived from a resistively terminated analogue network and the same configuration is used for the whole structure giving a modular design. Each section of the WDF has a single tunable multiplier coefficient that controls the parameters of the output pulse. In comparison to other digital filters, WDFs have the advantages of highly modular structures, minimum tunable coefficients and direct correspondence with analogue pulse-shaping network parameters.

**Keywords:** Wave digital filter, pulse-shaping network, radiation spectroscopy