

**Title:** Noise Shaped SAR ADCs current trends and challenges

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**Abstract:** Noise shaped SARs have undergone significant evolution since the first 2012 publication by Fredenberg citing 10bit ENOB with an OSR of 4 and an 11MHz BW. Currently the trends are moving towards dynamic and closed loop amplifiers which offer improved power and linearity,  $kT/C$  noise suppression and continued low OSRs. However, a new set of error sources come to the fore when these techniques are applied. The more prominent error sources now include mismatch and flicker noise.

This paper will cover a quick review of NS SAR basic blocks, and the driving reasons behind the new trends. Constraints placed on the NS SAR by support blocks around the converter will be discussed. Techniques for tackling the more prominent error sources will be examined such as mismatch error shaping techniques and calibration and conclude with some comments on flicker noise.

**Author / Presenter BIO:**

- Eric received his B.Eng from University of Limerick in 1998, and joined the cellular terminals group, working on audio and baseband switched capacitor Delta Sigma converters and filters.
- He briefly spent some time with Mediatek before returning to Analogue Devices in 2009 and worked on higher speed converters including ADIs highest speed SAR and pipeline ADCs and SERDES interfaces running up to 12GSPS, and radar CT Delta Sigma converters and baseband signal chains.
- Most recently he has joined the precision converter group. He is holder of several US patents and has been a key liaison person with researchers in MCCI, UL, and other institutes.