KOLLOQUIUM

Institut für Elektrotechnik, Elektronik und Informationstechnik

High Precision Digitally-Assisted Linear Circuits

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Cauerstraße 7/9, Hörsaal H5

Diskussionsleitung: Prof. Dr. Robert Weigel

To achieve a combination of low noise, offset, drift and wide bandwidth traditional high precision sensor, data acquisition systems, and industrial analog applications used expensive bipolar amplifiers, typically at +/-15V supply voltage. Due to process limitations these solutions did not have the “smarts”, such as reconfigurability, diagnostics and µC-control.

Recently advances in circuit techniques and technologies used in the design of analog amplifiers enabled a new variety of products for high precision signal conditioning in both low-voltage (<5V) and high-voltage (>10V) domains. This presentation will show how new ICs use techniques such as auto-zero, chopping and digitally-assisted calibration and signal processing to achieve single micro-volt-level offset and noise, AOL and CMRR/PSRR levels better than 120dB. Such amplifiers incorporate calibration DACs and ADCs, NV memory for calibration data, can flag input/output overload and faults. This is done transparently to the signal path allowing predictable “traditional” analog signal processing with no impact on bandwidth, distortion and settling time. Examples of precision linear ICs for sensor conditioning of pressure and magnetic field and industrial (PLC) analog front ends will be shown.