



**CZECH TECHNICAL UNIVERSITY IN PRAGUE**

**Faculty of Electrical Engineering**

Department of Measurement

# **Methods of Identification and Correction of Test Signal Imperfections used for Testing ADC Dynamic Parameters**

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## Summary

In the field of analog-to-digital converter (ADC) testing many types of test signals are applied for the evaluation of ADC dynamic parameters. The research introduced in this thesis is focused on the standardized and most common test signal—sine wave. Several possible imperfections of this signal are analyzed and, if necessary, their correction or an alternative method described. In addition, test systems of several European laboratories are compared because of the portability of results of ADC testing. For this purpose a new transportable high-stable reference ADC device was designed and the first prototype made.

## Resumé

V oblasti testování analogové číslicových převodníků (AČP) se pro vyhodnocení dynamických parametrů AČP používá mnoho druhů testovacích signálů. Výzkum popsán v této práci se zaměřuje na standardní a nejběžnější testovací signál – sinusovku. Je zde analyzováno několik možných nedokonalostí tohoto signálu a v případě nutnosti je popsán způsob korekce nebo alternativní metoda testování. Navíc jsou zde kvůli přenositelnosti výsledků testování AČP porovány testovací systémy několika evropských laboratoří. Za tímto účelem byl navržen a vyhotoven prototyp přenosného vysoce stabilního referenčního AČP.

## Zusammenfassung

Beim Testen von Analog-Digital-Umsetzer (ADU) werden viele verschiedene Testsignale zur Bewertung der dynamischen Parameter der ADU eingesetzt. Die Forschung, welche in dieser Arbeit beschrieben ist, konzentriert sich auf das standardisierte und am meisten verwendete Signal – die Sinuskurve. Dabei wurden mehrere mögliche Imperfektionen dieses Signals analysiert und, wenn nötig, die Möglichkeiten zur Korrektur oder alternative Methoden beschrieben. Zur Sicherstellung der Übertragbarkeit der Ergebnisse wurden diese mit mehreren Testsystemen einiger europäischen Labors verglichen und dafür ein neuer tragbarer hochstabiler Referenz-ADU entworfen sowie ein erster Prototyp realisiert.





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