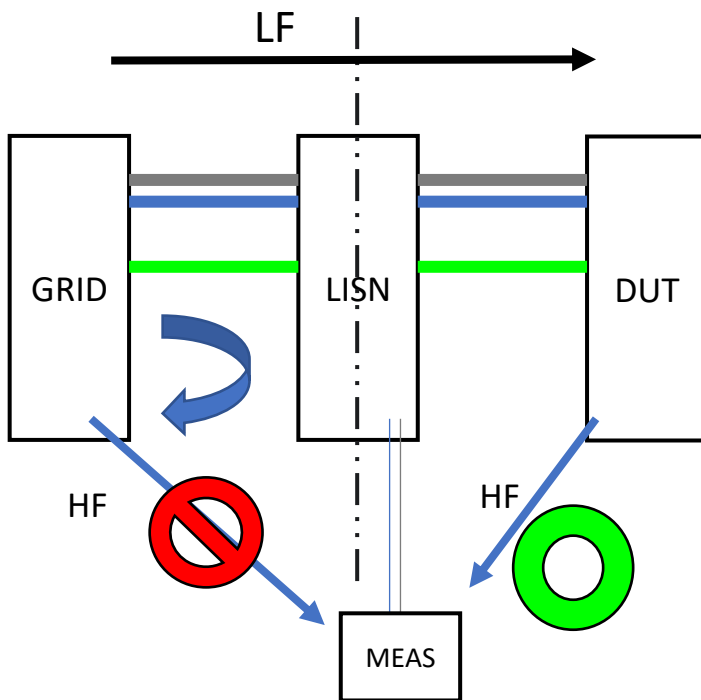


Line Impedance Emulation Network

Master thesis project



Summary:

Build a customised/customisable [Line Impedance Stabilization Network \(LISN\)](#) [1]. It is a device used in electromagnetic compatibility (EMC) testing to measure and analyze the conducted emissions from electronic devices. It is primarily used during testing to ensure that electronic devices comply with regulatory standards regarding electromagnetic interference (EMI). Conventional LISN provides a standardized impedance to the power lines, ensuring consistent and repeatable testing conditions. The impedance characteristic however should be representative of the EM environment the device is placed. The deployment of new technologies has a significant impact on the EM environment, which has not been included in the standardized LISNs.

Problem definition:

Conventionally used LISNs are reported not to be representative to the real-world application, hence measured EMI during testing often differs from the in-situ performance. In this research, a student will investigate the effect of the EM environment on the emissions of COTS devices, by developing a more representative test device - Line Impedance Emulation Network (LIEN).

Method:

The student will design an application-appropriate (automotive, aerospace, medical, marine etc) LIEN, and investigate its effect on measured EMI.

Research objectives:

- Investigate the existing types of LISNs and AMN
- Investigate the effect of LISN on EMI
- Design and validate a LIEN for a specific application area

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Courses and supervision:

This is a straightforward project and standard courses of BSc in Electrical Engineering would be sufficient. Additional knowledge of EMC is beneficial but not mandatory. A good affinity with Matlab is very beneficial for doing this assignment, and your basic circuit analysis theory.

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[1] Fu-Yuan Shih, D. Y. Chen, Yan-Pei Wu and Yie-Tone Chen, "A procedure for designing EMI filters for AC line applications," in IEEE Transactions on Power Electronics, vol. 11, no. 1, pp. 170-181, Jan. 1996, doi: 10.1109/63.484430.

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