

## **Adopting Direct Field Acoustic Noise testing technology for the replication of directional acoustic fields: challenges and preliminary results**

Acoustic testing is a milestone of any space program. Together with vibration and shock, the acoustic test is a part of the mechanical test campaign. Traditionally, these tests are carried out in reverberant chambers. In recent years Direct Field Acoustic Noise (DFAN) testing is gaining technological momentum mainly due to the flexibility of the speaker system combined with state-of-the-art centralized Multi-Input Multi-Output (MIMO) Control algorithms. Multiple studies have shown that this technology is fully capable to produce a sound field which approximates the one generated by a reverberant chamber and is uniform and diffuse. The goal of this work is to explore, via test and simulations, a new possibility enabled by a DFAN system: adopting MIMO Control to produce non-uniform and directional acoustic field. This paper reports the challenges and the preliminary results obtained during a test campaign where a medium-size DFAN system has been used to replicate a diffuse acoustic field and a directional acoustic field.

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