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JISFA5#2 - Large eddy simulations of launcher lift-off noise and comparisons to experiments

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During the lift-off phase of a space launcher, rocket motors generate harsh acoustic environment that is a concern for the payload and surrounding structures. Hot supersonic jets contribute to the emitted noise from both their own noise production mechanisms and their interactions with launch pad components, such as the launch table and flame trenches.

The present work describes the results of computations performed by ONERA to predict the lift-off noise from reduced scale models, carried out by CNES at the MARTEL facility operated by Pprime in Poitiers.

Numerical computations involve two in-house codes: the flow solver CEDRE, used in LES mode to accurately predict the noise sources, and the Euler code SPACE to propagate nonlinearly the generated noise to the far field. Results are discussed and compared with experimental measurements.

Presenter(s) : JULIEN TROYES (DMPE - ONERA - Université de Toulouse); FRANÇOIS VUILLOT (DMPE - ONERA - Université Paris Saclay (COMUE))

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