

SAFLOW: Modelado de Combustibles de Aviación Sostenibles para Bajas Emisiones. Simulación

Description

SAFLOW proposes a combined numerical and experimental strategy to investigate the emission characteristics and combustion performance of SAF considering different blends with the reference Jet A1 fuel in fundamental facilities both at atmospheric and pressurized conditions. The scientific and technological complexity of the investigated thermal and fluid dynamic problem, evidences the necessity of a suitable research framework that includes experiments, advanced model developments and high-fidelity simulations.

In particular, SAFLOW targets the creation of advanced methodologies for primary breakup, multicomponent evaporation models, and NO_x and soot emissions models for the simulation of SAF spray flames with large-eddy simulations, which would enable the investigation of combustion processes from certified 10-50% blends to 100% SAF. SAFLOW will identify the influence of processes such as atomization, evaporation, chemistry or turbulence-chemistry interactions on pollutant formation at conditions preferably reaching 100% substitution of fossil fuels to identify the limits of application of first generation SAF for aeroengine-like conditions. This knowledge will facilitate the development of cost-effective screening of alternative jet fuels, the design for advancing existing and new combustor concepts, and the integration of new sustainable alternative fuel resources into the aviation sector. The project stems from the coordinated effort of BSC and CMT to develop advanced combustion simulation technologies for low carbon aircraft propulsion. BSC and CMT have been working together in this field in several EU and nationally funded projects and this growing collaboration has helped the team to build a strong momentum around the field of combustion research for aeronautical combustors, which can successfully undertake the research challenges proposed in SAFLOW.

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