



CFD and experimental study of a diesel-H₂ marine compression-ignition engine

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The present study examines a commercial compression-ignition marine engine with double-pulse diesel injection, converted to a diesel-H₂ dual-fuel cycle using port fuel injection technology. The engine operates in electricity generator mode and features a four-stroke, turbocharged design with an air cooler. The study aims to validate CFD simulations performed with the specialised OpenFOAM library Lib-ICE, by comparing them with experimental test data at a specific operating point (20 kW and 1500 rpm). This initial comparison will help assess the reliability of the CFD results and propose potential improvements from a modeling perspective. The primary objective is to develop a robust CFD model for conducting parametric studies, varying parameters such as diesel injection points, H₂ percentage, and injection pressures for both diesel and hydrogen. For the validation process, CFD results will be compared with experimental data.