Overview of the ThermoFAST and BoilFAST Software Packages

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ThermoFAST is a thermodynamic property calculator for natural gas, LNG, ammonia and hydrogen with the ability to perform vapour-liquid-solid equilibrium calculations. It was developed within the Fluid Sciences and Resources group at the University of Western Australia, and is available through the Future Energy Exports Cooperative Research Centre (FEnEx CRC). The recently released ThermoFAST Version 2 is freely available for download as a desktop application for Windows and online as the web application ThermoFAST Web (https://thermofastweb.net/). Plug-ins and packages for a range of other environments, including Excel, Python and Mathematica, are under active development.

In this software demonstration we give an overview of the capabilities of ThermoFAST, including flash calculations, solid and hydrate formation, together with a range of visualization tools. We outline the key points of differentiation offered by ThermoFAST, including identification of multiple solid transition pathways and cutting-edge models for hydrates and pseudo-components. We also show how experimental data is integrated into the system, allowing for powerful tuning and visualization capabilities. Finally, we will briefly demonstrate BoilFAST, a tool for simulating boil-off and thermal stratification in cryogenic liquids, including LNG, liquid hydrogen, and liquid CO_2, which leverages ThermoFAST as its underlying thermodynamic engine and is also available through the FEnEx CRC.