HELYX-OS V3, THE NEXT-GENERATION GUI FOR OPENFOAM®

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One of OpenFOAM®'s main shortcomings has always been its lack of a Graphical User Interface (GUI). This has created a barrier to entry, especially for those new to CFD, and made many simple tasks error prone. HELYX-OS [1] is a product from ENGYS that attempts to remedy this shortcoming by providing an intuitive interface for creating and managing OpenFOAM® cases. Although there are already working examples of GUIs for OpenFOAM® the main objective of HELYX-OS is to make available an easy-to-use software for both new users approaching the software for the first time and advanced users which might want to use the GUI for daily work to quickly mesh, setup and run a case or testing different solution settings, different geometries, etc.

The GUI has been developed and maintained by ENGYS using both Java and VTK libraries since from 2012 when the first version of the software was released for Linux 64-bit distributions. All the installation files instructions are available from the GitHub website which also hosts a ticketing system for bug report and a dedicated forum for technical discussions.
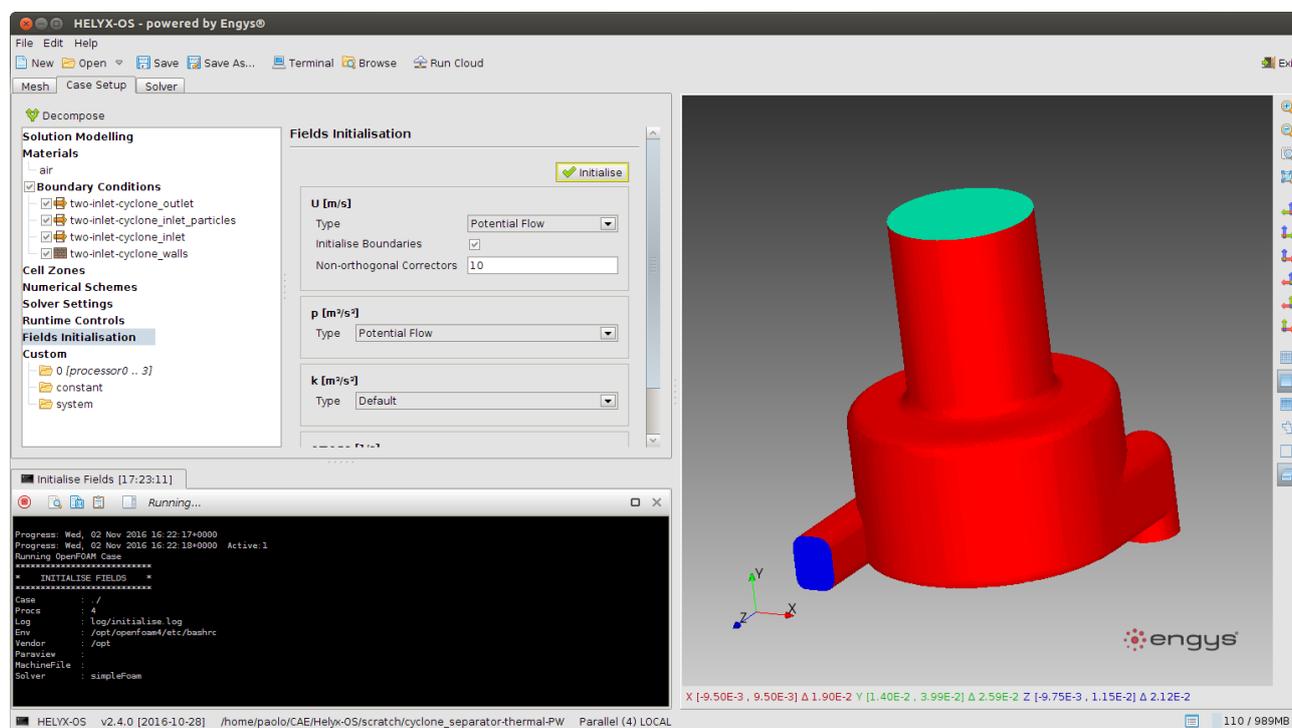

Figure 1 – HELYX-OS graphical user interface for OpenFOAM®

HELYX-OS layout (see **Error! Reference source not found.**) consists of three main components called Mesh, Case Setup and Solver which allows easy mesh creation, case setup, run and solution monitoring of an existing case. A 3D window for direct user interaction is available from within the Mesh and Case Setup components whose settings are defined in specific panels accessible by the users via specific buttons. In addition, the presence of a tree allows the grouping of both the geometrical entities (including surfaces and volumes) in the Mesh tab and the patches and cell zones in the Case Setup tab.

The key-features of HELYX -OS are as follows:

- Create a new case or load an existing case
- Support of serial and parallel cases
- Create a mesh using blockMesh and snappyHexMesh utilities
- Setup a case including turbulence model, boundary conditions, etc.
- Run and monitoring of a case in the Solver tab

HELYX -OS is designed to reproduce the typical user workflow starting from the case creation till the run execution through an intuitive user interface. In fact the presence of a series of buttons accessible by the user to specify the case settings has been designed to meet the requirements of both a wizard-based to follow each intermediate step from the case creation to the run execution in a serial mode and an advanced usage to quickly jump from one panel to another with necessarily going through all the steps required to setup and a case from scratch.

In the work detailed here we present the new version 3 of HELYX-OS, which brings considerable improvements with respect to the previous v2 framework, including the following features:

- New multi-region cases handling, e.g. for Conjugate Heat Transfer (CHT) cases
- A more consistent and intuitive ribbon-based design layout of both tasks and objects workflow
- Enhanced performance for handling of larger parallel cases
- New Run Mode pre-set for custom running scripts
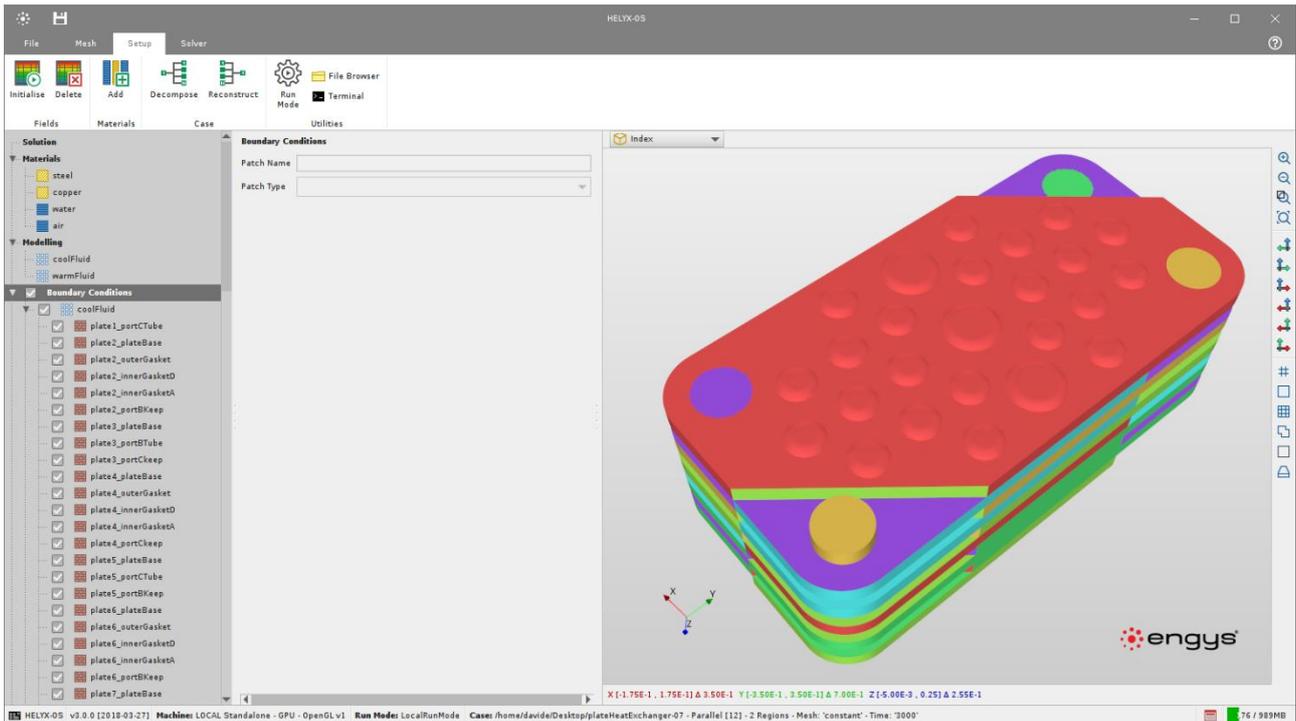- HPC and cloud-ready interface for execution of OpenFOAM® jobs

Figure 2 – New interface available in HELYX-OS v3

In addition to the features added to the new v3 version the authors will also share plans regarding the release roadmap to make sure that the continuous development process that ENGYS has been providing for HELYX-OS in the last years will help the community to use OpenFOAM® in a more efficient and productive way.

References

[1] HELYX-OS website: http://engys.github.io/HELYX-OS/