The ITER Integrated Modelling & Analysis Suite

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The ITER Integrated Modelling Programme has been established to meet the needs of the ITER project for accurately predicting fusion performance, developing efficient control techniques, supporting the preparation for ITER operation and providing the modelling and control tools required for the ITER exploitation phase.

A prototype of the Integrated Modelling & Analysis Suite (IMAS) has been developed based upon earlier work by the EU Integrated Tokamak Modelling Task Force. The infrastructure is constructed around a standardised data model capable of describing generic experimental and simulation data with the same representation. It consists of Interface Data Structures (IDSs) that act as standardised entities for exchanging data between physics components.

Software management tools are in place to support the integration and development of physics components, as are tools to automate building and regression testing prior to release. Demonstrations of the current IMAS functionality will be presented, including workflows encapsulating transport solvers using free-boundary equilibria based upon the CORSICA and DINA codes. Such workflows, extended with other physics components, will form the basis for pulse preparation, particularly when run in co-simulations with the Plasma Control System Simulation Platform that is also presently under development.

The integration of existing physics codes to extend the capabilities of IMAS and its application to present experimental data is an important part of the validation of the ITER Integrated Modelling Programme. The present status of the IM infrastructure will be summarised and the timeline for its future development and community use will be described.