

## Runaway electron modelling in the EU-IM framework

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We report on the status of runaway electron modelling in the EU Integrated Modelling (EU-IM) framework. One of the tools used in EU-IM is the European Transport Simulator workflow (ETS). ETS has a reduced kinetic code implemented (Runaway Fluid), which uses simple analytical formulae to estimate the runaway electron population [1]. We have imported ASDEX Upgrade experimental data [2] using EU-IM tools. The imported shot, 33018 is used as an initial condition in ETS to model disruptions triggered by massive gas injection (MGI). These simulation results are used for validation against experimental data, comparing mainly the runaway electron current and radiated characteristics.

The other EU-IM tool used is the Runaway Electron Test Workflow. To complement Runaway Fluid, we have also interfaced the NORSE code [3] into the framework, which calculates the electron distribution function in momentum space using a non-linear collision operator. A comparison of the reduced kinetic model with the NORSE and DREAM [4] kinetic models is reported. This is used to explore the range of applicability of the analytical Dreicer generation rate with varying plasma parameters and rapid change in the electric field. This work was carried out within the framework of the EUROfusion Consortium and has received funding from the Euratom research and training programme 2014–2018 and 2019–2020 under grant agreement No 633053. The views and opinions expressed herein do not necessarily reflect those of the European Commission.

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