

Proposals for ETS validation on JET hybrid discharges

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Activity-1 in 2011: Support Validation of the ITM tools (ETS)

- Verification of temperature and density transport solvers in ETS: V. Basiuk (ETS&CRONOS), J. Bizarro (JETTO), D. Coster (ETS), E. Fable (ASTRA), J. Ferreira (scripts to write CPO), D. Kalupin (ETS&JETTO), I. Voitsekhovitch (ASTRA, ETS, TRANSP)
- Verification of equilibrium solver and PFDE in ETS: V. Basiuk (ETS&CRONOS), J. Bizarro (JETTO), D. Coster (ETS), E. Fable (ASTRA), J. Ferreira (scripts to write CPO), D. Kalupin (ETS&JETTO), I. Voitsekhovitch (ASTRA, ETS, TRANSP)
- Verification of impurity solver in ETS: I. Ivanova-Stanik (ETS), P. Belo (SANCO), S. Moradi (ETS, RITM), D. Coster (ETS), D. Kalupin (ETS&SANCO)
- Benchmarking/sharing of transport models: V. Basiuk (ETS&CRONOS), D. Kalupin (ETS), B. Scott (IMP4/ETS: Bohm-gyroBohm, Coppi-Tang), P. Strand (IMP4/ETS: GLF23, MMM), I. Voitsekhovitch (ASTRA)

In more detail:

Title	Start date	End Date	Deliverable(s) (precise definition)	Dependent activities
Benchmarking of NCLASS	01/01/11	30/06/11	ASTRA, CRONOS, JETTO simulations	IMP3-ACT1, IMP4-ACT3 (NCLASS in ETS)
Benchmarking of Sauter neoclassical model	01/01/11	30/06/11	TRANSP runs for selected parametric domain	IMP3-ACT1, IMP4-ACT3
Benchmarking/sharing of transport models	01/01/11	31/08/11	New transport model in ETS. ASTRA, CRONOS, JETTO, simulations	IMP3-ACT1
Benchmarking of ETS impurity solver	01/01/11	28/02/11	JETTO/SANCO runs: benchmarking of reaction rates and radiated power	IMP3-ACT1,2

In preparation of benchmarking activity – modelling assumptions & input to be setup in ASTRA/CRONOS/JETTO/TRANSP:

- JET 77922: hybrid scenario with current overshoot, $B_{tor}=2.3$ T, $I_{pl}=1.7$ MA, high triangularity (0.38), 18 MW of NBI, $n_l=4.8e19$ m⁻³, $\beta_N = 2.8$
- Selected initial time slice 47.7 s: same use the same input data for all codes taken from TRANSP with normalised square root of toroidal flux coordinate
- Bohm-gyroBohm transport model for χ_e and χ_i and constant density profile taken at 47.7s
- Gaussian profile for H&CD (centred at $\rho=0$, half-width $\Delta\rho=0.3$), $P_{tot}=18$ MW, $I_{ni}=0.12$ MA. Power & current are not evolving. 70% on ion and 30% electron
- Two cases : i) Spitzer resistivity, zero BS current, ii) Neoclassical resistivity & BS current
- Run till steady state: 40 s fro CRONOS, ASTRA, JETTO
- ASTRA (E. Fable), CRONOS (V. Basiuk/J. Garcia), JETTO (J. Bizarro/F. Koechl ?), TRANSP (I. Voitsekhovitch)
- ETS (V. Basiuk/D. Kalupin, S. Morani ?)
- Exp2itm (D. Kalupin), CRONOS->CPO (V. Basiuk), TRANSP->CPO (J. Ferreira)
- Impurity simulations (Irena & Sara)

Plasma profiles (TRANSP)

