EFDA Task Force Integrated Tokamak Modelling EUROPEAN FUSION DEVELOPMENT AGREEMENT Heating, Current Drive and Fast Particles Physics (1)

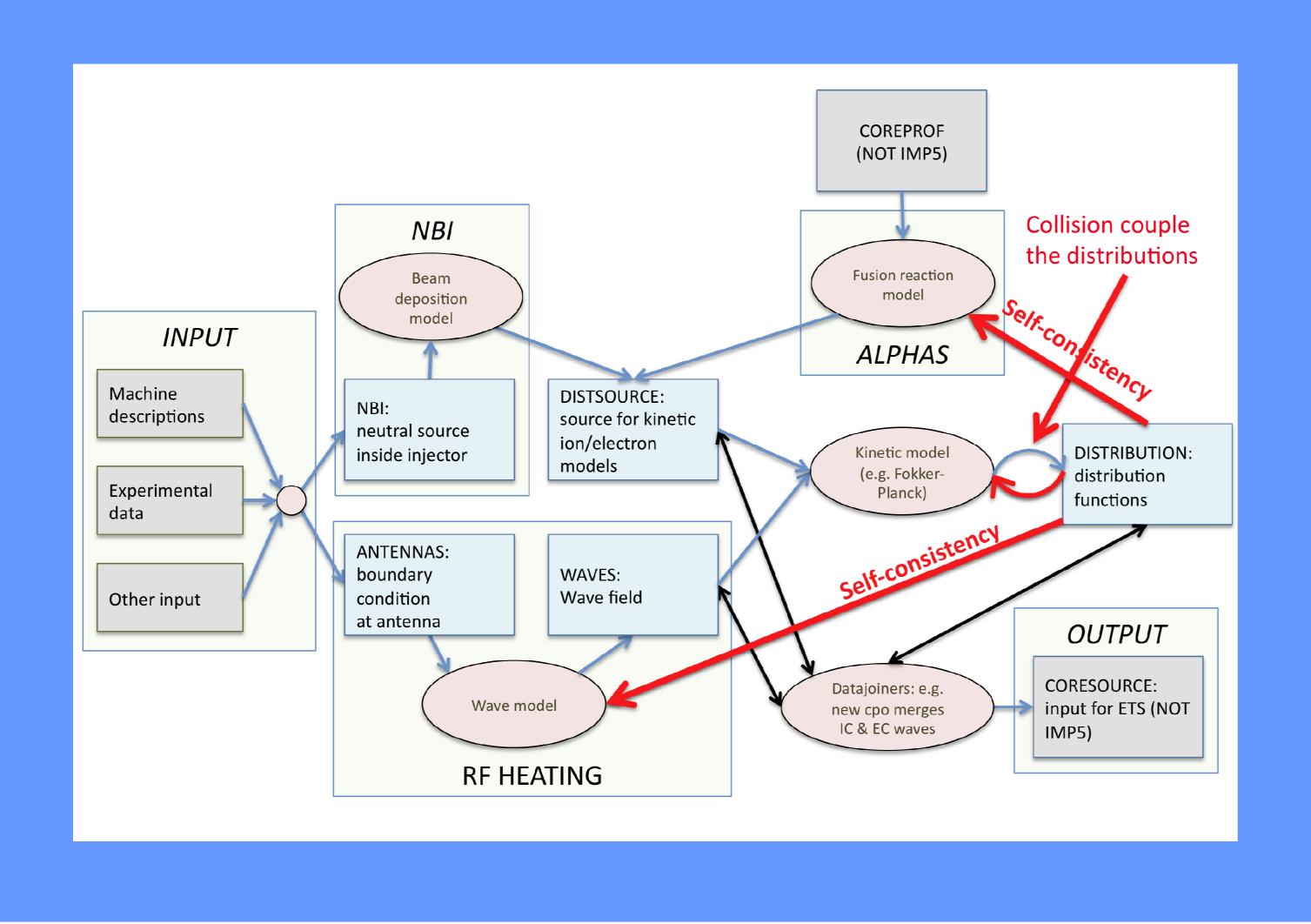
Within ITM-TF a specific Integrated Modelling project (IMP5) covers all areas in H&CD physics, e.g., EC, IC, NBI, LH, as well as alpha particles and fast particle interaction with instabilities

Main physics issues and goals

The scope of the project is to provide a modular package of codes simulating heating, current drive and fast particle effects.

Codes are being integrated in workflows to address different physics problems, as e.g., provide heating and current sources for transport simulations (ETS) and MHD instability control simulations.

The ultimate goal is to enable self-consistent simulation of heating and current drive in the presence of fast particle instabilities, especially for ITER



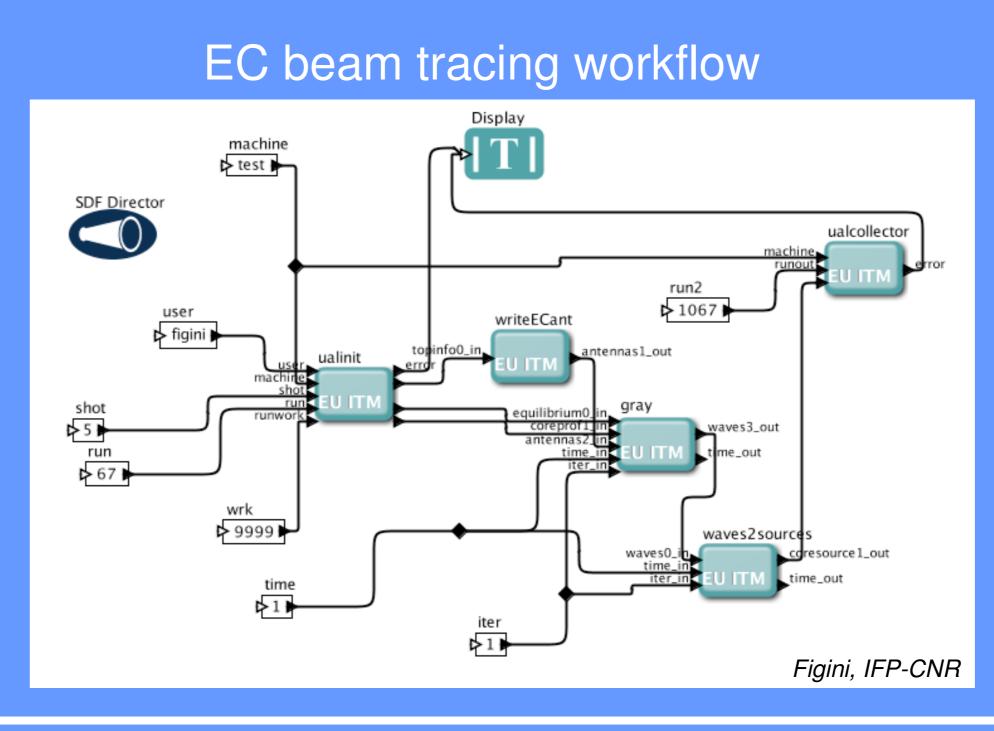
EFDA ITM-TF Expo "The European Integrated Modelling effort : challenges and achievements" – 38th EPS 2011 D Farina IFP-CNR, T Jonsson VR, G. Vlad ENEA, O Asunta TEKES, N Bertelli FOM, R Bilato IPP, A Cardinali ENEA, G Csepany HAS, R Dumont CEA, LG Eriksson EU, L Figini IFP-CNR, V Goloborodko OAW, T Hellsten VR, N Maruschenko IPP, M Schneider CEA, Y Peysson CEA, E Poli IPP, G Steinbrecher MEdC, S Sipila TEKES, LE Sunden VR, E Westerhof FOM

EC & LH physics

Electron Cyclotron (ECRH&CD) and Lower Hybrid (LHCD) codes ported to ITM deal with a variety of models, as, e.g., optical and quasi-optical ray-tracing codes, beam tracing codes, as well as different current drive (CD) models.

Fokker-Planck codes (RELAX, LUKE) with different levels of complexity are also available.

The codes TORBEAM, GRAY, TRAVIS, TORAY-FOM, C3PO, RAYLH are well suited to estimate ECCD/LHCD capabilities in present tokamak plasmas as well as in ITER.



ITER EC Upper Launcher main goal : control of MHD instabilities (neoclassical tearing mode / sawtooth)

