Some thoughts on the requirements of the EFDA Task Force on Integrated Tokamak Modelling for Atomic, Molecular, Surface and Nuclear Physics Data

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Data needs

- The ITM has identified the need for
  - Atomic physics data
    - Rate coefficients (mainly for the fluid codes) for ionization, recombination, charge exchange, electron cooling …
    - Cross sections (mainly for the kinetic codes)
      - Ionization, recombination, charge exchange, electron cooling …
      - NBI
    - Individual line radiation (diagnostics)
    - Bundled charge states included
  - Molecular data
    - $H_2$, $D_2$, $T_2$, HD, HT, DT
    - $C_wH_xD_yT_z$
    - …
  - Surface data
    - Sputtering/Reflection coefficients
      - Including mixed materials
    - Chemical sputtering
      - Including mixed materials
  - Nuclear physics
    - Fusion cross-sections
    - Cross-sections for diagnostics
Constraints

• Amongst the identified constraints
  – Consistency
    • consistent use of data across the ITM
    • consistent set of data
  – Would need to be able to repeat a code analysis that was done years before
    • Version control
    • Centralized storage of data in a database?
  – Probably would need to share the data with the ITER partners
    • Any "special" IPR protection need to be identified at an early stage
Call for “Group of Experts”

- In the next “Call for Participation” in the ITM
  - The “Heads of Research Units” will be asked to identify experts in the fields of
    - Atomic physics
    - Molecular physics
    - Surface physics
    - Nuclear physics

- These people will be asked to identify solutions for the A/M/S/N data of the ITM-TF
Scope of ITM AMSN Group

• The ITM AMSN group would likely be formulated with a suggested scope to
  – Identify and report on detailed ITM needs for AMSN data (collaborative work with IMP's)
  – Propose a strategy for implementing an ITM (software) capacity for AMSN data (collaborative work with ISIP?)
  – Act as a response group towards suggesting interim solutions

• Timing and deliverables
  – The group will be initiated in January 2008 and will have a deadlines for reporting in June 2008 on the first and by September 2008 on the second.
    • This is to guarantee that we can provide a Call for participation for the 2009 programme to implement the proposed tools within the ITM programme in 2009 (likely under Preferential Support).
  – The response group would have a continuous activity during both 2008/09